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THE FISHER MOUND GROUP, SUCCESSIVE ABORIGINAL OCCUPATIONS NEAR THE MOUTH OF THE ILLINOIS RIVER

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IN NORTHEASTERN Illinois, about 60 miles southwest of Chicago, where the Des Plaines and Kankakee Rivers converge to form the Illinois, is an old Indian village and mound site which after extensive excavation has yielded interesting disclosures. In this region evidence of aboriginal occupation is generally denoted by surface deposits of chipped flint, fragmentary pottery and occasional polished stone artifacts. More than one culture is doubtless represented but there is no way of determining this. The mounds to be described give opportunity for such determinations. Their outstanding features are:

Numerous superimposed graves arranged stratigraphically and culturally marking at least three occupations, with brachycephals above and dolichocephals below;

An intermediate pre-European culture prolific in small triangular chert arrowpoints, clay pots and artifacts of stone, bone, copper, and shell. Post-European objects are few and confined to the surface.

The locality, formerly part of the Cornelius estate in Will County on the Will-Grundy County line, is known as the Dan Fisher farm. It may be reached by automobile from Joliet on State Road No. 7, driving 11 miles to Channahon, then leaving the concrete and crossing the Des Plaines River over Smith's Bridge. From there the right-hand road follows the left bank of the river past Fisher's, the latter being about five miles beyond Channahon.

FIG. 1
The Fisher Mound Site, Will County, Illinois. Scale 1" = 150 feet.

The Fisher Site

This site is a glacial limestone gravel deposit overlain by a veneer of dark surface soil, with sandstone and clay of the Lower Coal Measures beneath. The land is about 30 feet above the Des Plaines River and overlooks a lowland which extends from the

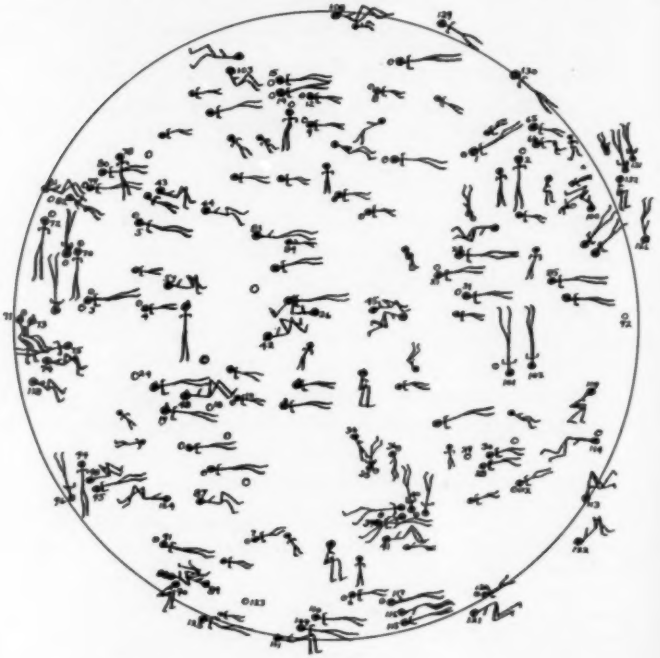

Fig. 2

Fisher's. Plan of the Big East Mound. Scale 5/64″ = 1′. Showing the human burials and clay pots, 0. Infants are the smaller manikins.

water inland 75 yards or more. 100 feet back from the low bluff's edge are two circular eminences: the "Big East Mound" 5 feet high and 50 feet in diameter, and the "Big West Mound" 6 by 60 feet. Near them are the smaller and almost unrecognizable "Small East," "West," "Southeast," and several other mounds

and around these are about 40 circular pits, from 15 to 30 feet in diameter, several feet deep and bordered by raised gravel ridges. Another group of mounds, or rather burial-heaps, originally three,

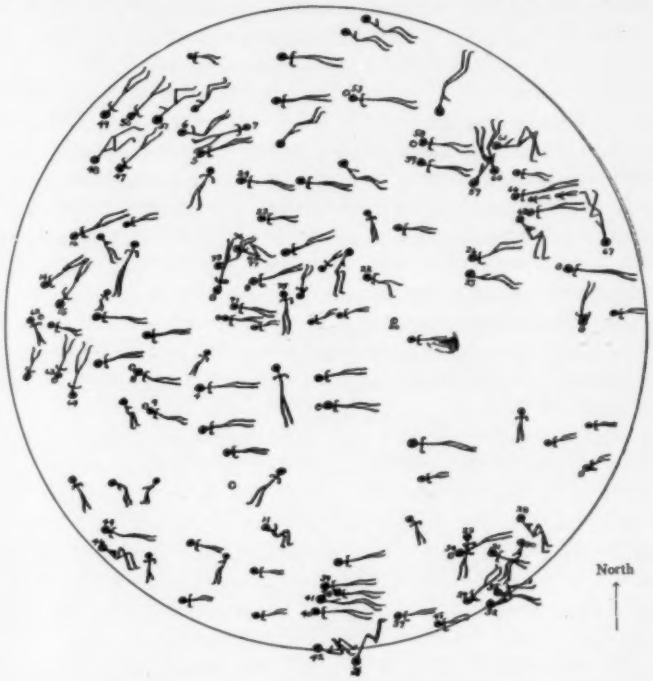

FIG. 3

Fisher's. Plan of the Big West Mound. Scale 5/64″ = 1′. Showing human burials and clay pots, 0. Infants are the smaller manikins.

now two, lies about 100 yards west of the two big ones on the Will-Grundy County line near a shallow gravel-pit made by the excavation of material for road-building. See map, fig. 1.

THE SMALL EAST MOUND

In November, 1906, Mr. Howard Calmer and myself, both of Joliet, were attracted to this spot by numerous colored glass beads

which a rodent had brought to the surface while burrowing. We dug into the center of the mound and at a depth of two feet came upon an adult male skeleton lying prone with a rusty iron knife, silver crescent and pendant, small glass beads, bits of cloth, a carved bone, pieces of copper plate, and several painted wooden sticks. The man's skull measured 181 mm long and 143 mm wide, cephalic index 78.9. The limb bones indicated a stature of about 5 feet 8 inches. A snow storm interrupted our labors, and next spring others, continuing where we had left off, discovered two more male and two female skeletons, the males being accompanied by numerous silver pieces: reliquaries, crosses, round brooches, pendants, bracelets and arm bands, also a small mirror, patched iron pot, pierced clam-shell bone pin, cloth fragments, large glass beads, pieces of copper plate and one large stemmed arrow-point of pinkish flint. Several of the silver brooches were embossed "G.C." and "Montreal," denoting George Cruikshank, a Montreal silversmith of post-Revolutionary War times. The burials may therefore be dated at about the close of the 18th century. The skeletons all lay upon their backs and the bones resting in black soil were poorly preserved.

In 1912, hoping that there might be more in this mound, I again dug into it and after passing through the litter of previous exploration, came upon two undisturbed adult female skeletons buried in a foot of gravel 18 inches below ground level. Near the head of one of them was a small shell-tempered clay pot with bark-like surface. These were brachycephals lying upon their backs with lower limbs slightly bent. The mound, approximately 25 feet in diameter and 3 feet high, consisted of two feet of dark soil with a thin seam of grey compact gravelly earth beneath, overlying 2 to 3 inches of dirt and ashes. This lower layer contained charcoal, fragmentary animal bones, and clam-shells. The lower burials could be traced up to the ash layer but not above it.

For convenience I will hereafter refer to dolichocephals as long-heads, mesocephals as mesos and brachycephals as round-heads. When the cephalic indices of the latter exceed 85, I call them broad-heads.

The Southwest Mound

Mound-digging is not a pastime calculated to hold one's interest long as a rule—so I had learned from previous experience. A day's work invariably ended with nothing to show for it but a ruined disposition and an exhausted body. The discovery of silver and other European artifacts in an Indian mound inspired no more than my temporary interest; but the hint of what might be below them was impressive. Accordingly I sank two holes about four feet square, in the Southwest Mound which was slightly larger than the first one—about 30 feet in diameter and 3 feet high. One of these excavations yielded superimposed burials,—round-heads above, mesos below; all women and children. Believing that the Fisher site was well worth exploring, I endeavored to interest scientists in the work for which I did not feel justified in devoting my time and expense. However, I was unsuccessful in arousing material interest and so for another ten years the site remained undisturbed.

Work of Excavation

Until 1922 the mounds and pits had never been touched by the plow; but finally the ground-mound, pits and all, was ripped open and sown with wheat. In 1923 it was again cultivated for corn. This was too much for me. The two big mounds had so long been in my thoughts for the mysteries they might contain that after witnessing two plowings and foreseeing their ultimate destruction, I began work upon them in the fall of 1924, never dreaming, however, of the magnitude of the undertaking in which I became involved as I progressed. At first I had only intermittent assistance,—a temporarily interested helper one day, and another the next; but soon it simmered down to one man, Albert Tennik, Plate VIII, Plate IX, c, a Hungarian by birth, American by adoption, tall, powerful, and an indefatigable worker, who with continued experience became an expert. Actuated solely by interest akin to mine, he carried me on through a siege of painstaking and exhausting labor which I could not have long endured unaided. 80 days have already been spent upon the two big mounds alone and these are not quite finished. The other mounds and circular pits are only partially explored.

Our undertaking was not conducted in the manner I would have chosen, as we had but one day a week available and were not permitted to leave any open holes, each day's digging having to be filled in again. At first we feared that each visit might be our last, believing that Mr. Fisher, owner of the land, would not permit us to continue indefinitely; and so the need for haste prompted us to pass over many interesting details. Later, being secured from interruption, we used greater care and observed more closely, which we were glad to do because of the abundant material. I estimate that over 155 individuals were buried in the Big East Mound, 140 in the Big West Mound. Of these, I discovered 234 intact; 44 had been disturbed by previous excavations; and more remain. I have removed 70 clay pots; others were destroyed; and there are more left. In addition 90 human skeletons have come to light in the smaller mounds and around the pits. Numerous artifacts of bone, antler, shell, copper, flint and polished stone accompanied the human skeletons in the two big mounds. The diggings abounded in potsherds, clam-shells and broken animal bones. Graves filled the whole area of each big mound, one burial being superimposed upon another sometimes four high. What appeared at first a confused snarl, gradually untangled itself, when careful observation disclosed that the mass was really a composite of three or more levels, each defining a distinct human occupation.

Stratigraphy of the Two Big Mounds

My first visit here was in 1898 and when in 1912 I made a close external examination, the mounds seemed in no wise changed. See plate IX, a and b. In 1906 the Big East Mound stood about 6 feet above ground level at the crest. The latter had been dug into at several points leaving a shallow crater. The original height seemed to have been over 7 feet. In 1924, cultivation had reduced this height to 5 feet. In the ground around it, the black surface soil 6 in. deep became mixed with gravel for another 6 in., then changed suddenly to limestone gravel, light buff in color and absolutely free of dirt, the interstices between the large stones being filled in with smaller ones and fine particles,

PLATE VIII

Work on Big East Mound. George Langford (right), Albert Tennik (left). Rim excavation.

a

b

c

d

PLATE IX

a. The Big East Mound in 1912. Later I found the small EM 65 round-head under where I am standing. Beyond me, the Big West Mound and thorn-apple tree on it can be dimly seen. The mound height can be compared with my height. I am 6′4″ tall. b. The Big West Mound in 1912. G. Langford stands on the center. A thorn-apple tree grew from the northwest portion. The camera points a trifle north of west. c. Excavation of the Big East Mound, July, 1926. Working around the rim. G. Langford in foreground; Albert Tennik at right. The camera is pointed north. d. WM 11. No modern excavations appeared to have disturbed this skeleton and yet only the trunk was present. At the left shoulder is a crushed pot containing a shell spoon.

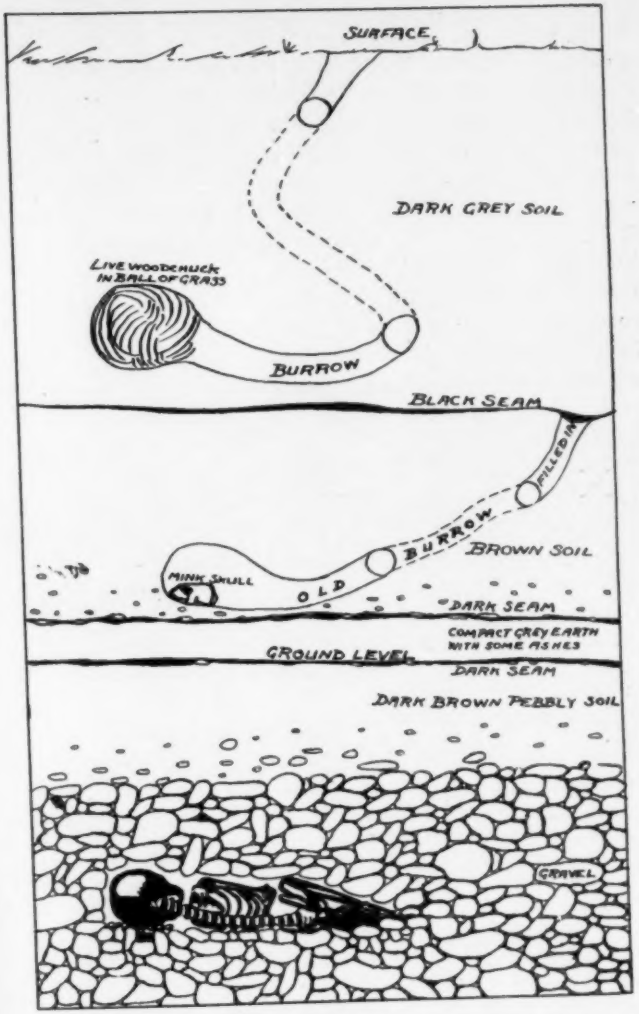

FIG. 4

Fisher's. Big West Mound. 5/8″=1′, 9 foot section looking north showing the female adult long-head WM 76 in gravel with infant WM 77 behind her. The head of WM 76 lies upon a pebble mosaic with small stone block in center. Two marine gastropod shell ornaments were touching the face.

pointed north. [illegible] shoulder is a crushed pot containing a shell spoon.

almost coarse sand. This gravel is presumably late Glacial and derived from the Niagara limestone which outcrops along the Des Plaines Valley eastward as far as Chicago. Beneath the Mound the gravel deposit must be at least 20 feet thick. It overlies the clays and sandstones of the Lower Coal Measures, well-exposed about ¾ miles to the west along the banks of the Kankakee River. The mound's elevated position with gravel beneath, its sloping sides and compact structure, all went to make ideal drainage, a condition well-suited to preserve the contents. Of all the mounds I have dug into, this one far excelled in its facilities for the preservation of human bones and other semi-perishable substances in all seasons, dry or wet, warm or cold. Bones sealed in the gravel could have survived there indefinitely.

In 1924 the upper three feet of the mound was composed of rather loose dark surface soil. I arbitrarily term this the Upper Level. At its base was a dense black layer ½ to 1 inch thick, which seems to be composed mainly of vegetable matter almost mineralized. I call this the Black Seam. In places it thins out into patches of gravel, or thickens, but is ever present and continuous, almost to the mound's periphery, where it is several feet lower than at the center. Beneath the Black Seam is 1½ feet of brown pebbly soil, a hard, compact mixture of dark earth and gravel becoming coarser at the bottom. Below this is an Ash Layer 6 inches thick consisting in places of white ashes with bits of black charcoal above and coarse brown soil mixed with ashes below. Broken animal bones and clam-shells, both burned and unburned, are scattered through the mass, which instead of being continuous through the mound seems to be a collection of deposits one over each grave, the intervals consisting of very hard light grey earth mixed with pebbles. This layer, like the Black Seam above it, continues through the mound and is about 6 inches higher at the center than around the border. Its upper surface is topped with a thin seam of hard grey earth occasionally passing into patches of fine gravel. Its lower surface rests upon a thin layer of grey and brown dirt changing here and there to small gravel. This bottom layer is slightly above ground level at the mound's central

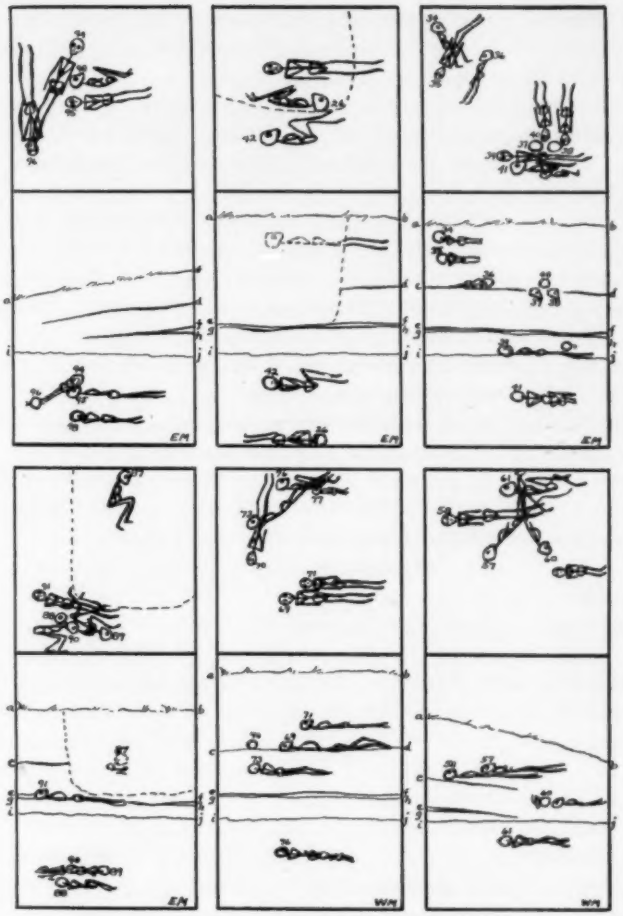

FIG. 5

Fisher's. Mound sections—all looking north—showing superimposed burials. Four are East Mound sections (EM); 2, West Mound (WM). Scale 1/4″ = 1′. The dotted lines denote old excavations.

a–b, Mound surface; c–d, Black seam; e–f, Top seam of ash layer; g–h, Bottom seam of ash layer, ground level; i–j, top of limestone gravel.

The top of each oblong is a plan, the bottom a verticle section of it viewed from the south.

area and from 4 to 6 inches lower around the outer portion. It rests upon 9 inches of brown pebbly and sandy soil, the latter in turn lying upon the main gravel deposit. The two seams enclosing the Ash Layer I came to look upon as the most important landmarks in the mound and I used them assiduously to locate the origin of every grave beneath them. Without such marks it would have been impossible to distinguish one grave from another; but as used, each grave could be followed upward to its place of origin and located stratigraphically. Inversely, the two seams invariably proved to be the determining factors, the oldest burials having both seams over them intact, the next oldest showing complete penetration through the lower seam but not through the Ash Layer or seam above it. With continued practice these observations were easily made and are, I believe, to be depended upon. The Black Seam farther up proved a third important landmark and I used it in the same manner as those below. There is no question in my mind but that the three seams enumerated are the main factors in this mound for determining its meaning stratigraphically and for finding the true relationship of one burial to another. My main task was to locate them correctly and not be misled by streaks and other local soil irregularities, a task requiring careful observation. My continued interest in the work lay largely in this phase of it,—the search for landmarks to find the place of origin of each grave. What with the numerous burials, I spent few dull or idle moments. Our first efforts were spent in what seemed to me a vain effort to arrive at some system of determining the meaning of various constant features persisting amid the apparent confusion and, until we learned from experience, we passed over things apparently of no importance but which we were careful to observe later; therefore the data on some of our early finds are incomplete and uncertain. As most of the human skulls were found crushed or distorted, not much could be learned from them until they were mended—a time-consuming and laborious process. However, even without skeletal evidence, certain peculiarities soon showed themselves.

In the upper part of the mound half way down to the ground level we learned to expect no important finds of artifacts, and the

skeletons lay in various postures, some upon their backs, others upon their sides, the limbs being in all positions. The few clay pots were small and knobbed around their shoulders, with little attempt at ornamentation. Flint and chert arrowpoints were the same as found upon the surface throughout the county, not small, and usually notched or stemmed.

On nearing ground level, skeletons invariably lay upon their backs and uncrushed skulls proved to be all brachycephals. More relics appeared with the burials. Knobbed pots gave way to larger and finer ones with considerable ornamentation of a certain kind that I call "antler-point," inasmuch as the designs appeared to have been engraved with antler-tips, of which I found many. With these were pots with rough bark-like surface, bearing little other decoration. Large notched and stemmed arrowpoints were replaced by small triangular ones, very thin and sharp and usually made of chert. Slightly above ground level, ash-beds were common, although in places we encountered grey dirt, so hard and compact as to resist any effort with the shovel and requiring the use of a pick. In some places ash-bed and hard earth blended in a continuous layer.

Beneath the ash-bed and below ground level were many graves clearly exposed by grey and brown pebbly dirt which contrasted strongly with the light buff limestone gravel deposit. These graves were easily found. The skeletons in them were all brachycephals, mostly females lying upon their backs and the uncrushed specimens showed unusually broad skulls. "Antler-point" pots were common, becoming larger and finer. Small triangular chert arrowpoints still prevailed, accompanied by a rude bone and shell culture.

Having learned that the finest pots, most abundant artifacts, and best-preserved skeletons were to be found near or below ground level, our attention centered there, for graves were very numerous. Sometimes we stumbled upon burials filled in with gravel instead of contrasting colored earth and no pots or artifacts could be found in such graves, nor were any of the skeletons lying flat on their backs. They were on their sides or half way on their backs or faces, and the few crania mended showed them to be

other than brachycephals; furthermore large males predominated. Some of these graves could be detected from above if examined very closely, the gravel texture and color above them being slightly different from the surrounding deposit. Other graves betrayed no sign of their presence after the closest examination and I simply dug deeper and found them occasionally, much to my surprise. I could recognize only mesos in the semi-concealed graves and long-heads in the concealed ones. These facts persisting may assist in explaining the importance I attach to the Ash Layer, particularly its enclosing seams above and below.

Each of the two Big Mounds had been casually excavated in several places prior to 1906, the holes being from four to five feet square but in no instance had they gone deep enough to reach the oldest burials in gravel. The Upper Level had served for a long time as an animal winter resort, the ground around the mounds being too poor in soil for the purpose. In December 1924 I encountered a woodchuck, garter snake and 6 lizards, all alive at a three-foot depth in the Big East Mound. I also found a sleeping woodchuck in the Big West Mound and traces of numerous old burrows in both. Many of the higher burials had been damaged by these inroads, plate IX, d, none of which however had penetrated the Ash Layer. Some of these old burrows contained bones of moles, rabbits, mice, and woodchucks which were often not readily distinguished from the numerous animal remains originally piled in with the dirt. These disturbances often made determinations difficult in the Upper Level, particularly in the Big West Mound. The latter, although much like its neighbor, contained a much larger amount of dark soil, which descended more than a foot below the Black Seam. The latter was 6 inches higher up, and the dirt between it and the Ash Layer was greyer than in the Big East Mound and with fewer pebbles. The Ash Layer, the two seams enclosing it, and all below were, however, much the same. The human burials in it differed slightly from the Big East Mound, however, in that only one broad-head appeared in the Middle Level, this deficiency being made up by numerous graves whose position is doubtful but which probably belong, some to the Lower and others to the Middle Level.

The Upper Level

After my 1906 experience with the small Southeast Mound, I expected to find post-European objects in the two big ones; but all that I did find was an infant burial with glass beads and a round silver buckle in each, plate X, a. These were near the center of each mound and close to the surface, representing all of the post-European artifacts observed. There were also some copper fringe-holders made of plate bent into small cones.

The upper three feet of both mounds had contained human burials, but plowing, previous excavations, and burrowing rodents had minced up the skeletons. Among the few badly broken skulls and bones recovered I found no individuals of unusual size although they were as a rule larger than others buried deeper. Conditions were more or less unsettled down to the Black Seam of the Big East Mound and in places from one to two feet below it in the Big West Mound, whose upper four feet contained more burials than the former. Consequently the place of origin of each grave was most difficult to trace, and when it could be traced frequently the skull was poorly preserved. However, I secured not a few fine skulls and bones assignable either to the Upper Level or to the top of the Middle Level. They are round-heads and mesos which appear to differ from the deeper skeletons, plate XI, d. In only one case, and that with some doubt referred to the Upper Level, were the human skeletons accompanied by artifacts, the latter consisting of five crude arrowpoints or rejects placed close to the head. These pieces were unstemmed and made of chert. Notched and stemmed arrowpoints occurred in the Upper Level of both mounds but none were directly associated with the skeletons.

The Middle Level

This section of both mounds abounded in human burials and relics,—clay pots and artifacts of stone, bone, copper and shell. Certain types of pots found above the Ash Layer did not occur below it. Above the latter was the great bulk of loose refuse, potsherds, chert flakes, clam-shells and splintered animal bones. In the lower portion, undisturbed except in a few instances, certain

characteristics persisted, in contrast to the confusion reigning above. Twelve skulls, the first ones mended, which I traced up to the top seam of the Ash Layer in the Big East Mound, are brachycephals. Six of these extended upon their backs and accompanied by pots, are broad-heads with cephalic indices ranging from 85 to 91. Of the other six, none had pots, the cephalic indices ranging from 80 to less than 85. All were in gravel lying irregularly without relics of any sort. The six with pots had artifacts of stone, chert, copper, bone, and shell. All the residents beneath the Ash Layer were comparatively small individuals. They lay on or in the underlying gravel deposit. The height-length, nasal, facial, orbital, and gnathic indices show the skulls to be rather high, noses medium to narrow, faces both broad and long, eyes medium to low and features somewhat prognathic. A characteristic of the Middle Level was the presence of small triangular arrowpoints, unstemmed and made of chert. Caches of 3, 6 and 8 were near the heads of skeletons, one long slender "drill-point" accompanying each lot. Not a single notched or stemmed arrowpoint appeared in this level although I found 18 above the Black Seam.

The Lower Level

The skeletons in this section were all buried in gravel, and as gravel with almost no dirt was used to fill in some of the graves, they were very difficult to detect. Others had not the slightest sign of dirt and their discovery was purely accidental. Of the first noted, the great majority lay upon their sides in semi-crouching positions, facing north, heads west, feet east, buried from 2 to 3 feet below ground level. All were mesos with high heads, narrow to medium noses, faces massive, eyes generally medium and features decidedly non-prognathic. Unlike the brachycephals, their lower jaws were powerfully developed posteriorly. Among them were the largest individuals in the mounds. Of the concealed burials 6 came from the Big East and 2 from the Big West Mound, buried 3 to 4 feet below ground level. All had long high skulls, narrow to medium noses, medium faces, low orbits and decidedly non-prognathic features. Two were

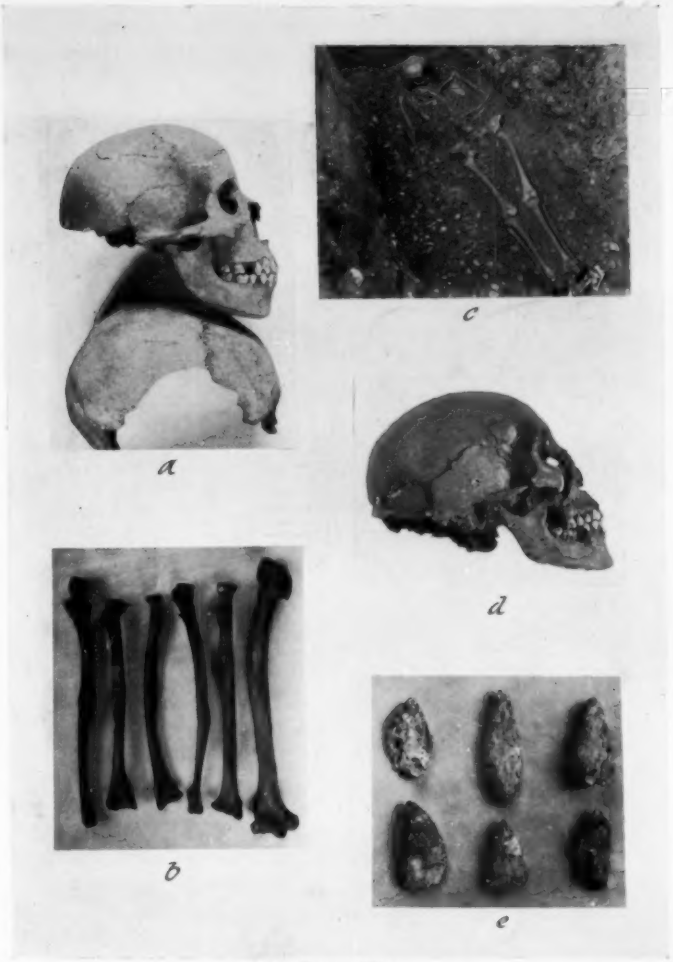

PLATE XI

a. The top skull is EM 21, a child with shell pendant, clay pot and tiny copper plate beads. Zone II of Middle Level. Prone burial with face to the east. Note the obtuse jaw angle and prognathic features. The lower cranium is SW 1, the only true long-head found outside of the two big mounds. 3/16. b. Human bones. Left to right: WM 15—broken ulna at center of shaft; WM 30-radius broken and healed at wrist. The center radius and ulna show curvature common to some of the skeletons. To the right of them is a broken and healed ulna, then a radius widened out at the shaft. The outer right hand figure is the humerus of WM 75 diseased at head and much curved. 1/8+. c. WM 66. Prone adult female round-head in Zone II of Middle Level. An infant was close to the right forearm and another near neck of right femur. The bones are visible. No relics with the skeleton. The camera is pointing northwest and down about 45°. d. EM 39. Narrow faced round-head female with stub handled pot. This burial directly overlay the deep long-head EM 41. Note the decomposed basal part of skull and the inclined lower jaw with obtuse angle. 3/16+. e. This cache of chert "rejects" was under the head of a male adult round-head, WM 67, at the base of Upper or top of Middle Level. 1/4.

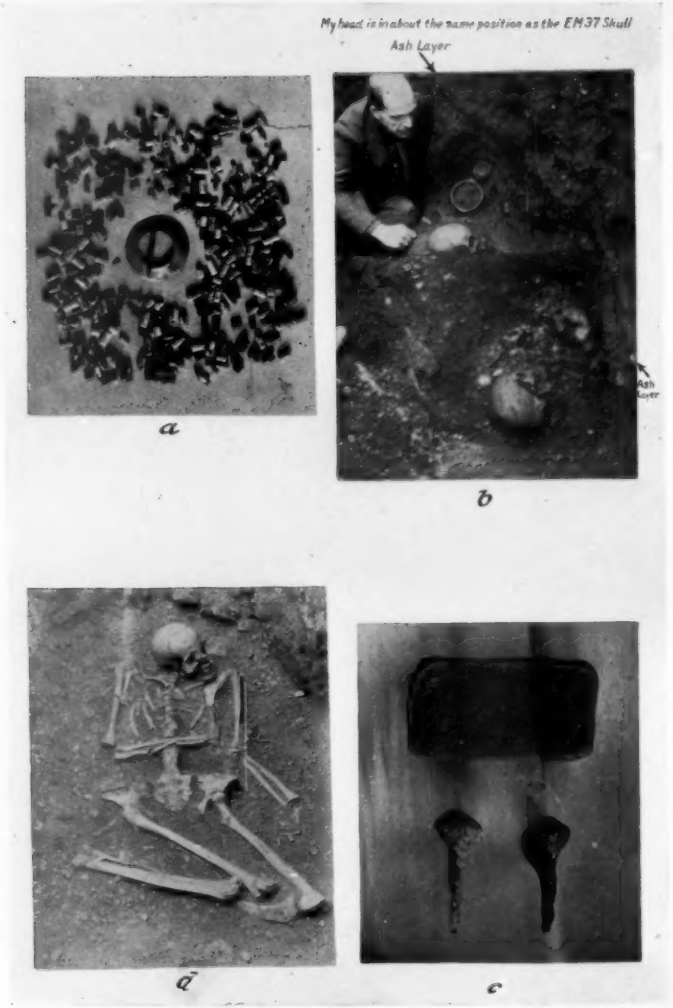

PLATE X

a. EM 34. Silver brooch and glass and Kaolin beads with child EM 34. Plowing had exposed these on the surface. No other Post-European objects appeared in the mound. b. Upper half, EM 39 with large pot and small pot. I have removed EM 39 skeleton. Camera pointing north and down. Lower half, EM 41 in gravel after removal of EM 39. Camera swung down to 60°. c. WM 73 with female long-head WM 76. The two marine gastropod shells were touching the face. The stone block, a pink stone with green veneer (gneiss?) is unfabricated but formed the center of a mosaic of 1″ limestone pebbles on which the skull rested upon its left side. 3/8. d. EM 125. Young female adult round-head. In the crook of the left elbow were the remains of a tiny infant some of whose bones are shown.

females accompanied by infants, the other 6 being males. They lay facing north in crouching positions without pots or relics, barring two with a few ornaments made from marine gastropod shells. A third had four flints of doubtful human workmanship.

Superimposed Burials

Many graves were directly over others, frequently in tiers of two or three, sometimes four. For purposes of identity I will specify the various burials as I have marked the specimens; for example, WM 76 denoting skeleton and relics No. 76 from the Big West Mound; EM 26, burial No. 26 in the Big East Mound, etc. All measurements unless otherwise specified, are in millimeters. To avoid endless repetition of the words "above ground level" and "below ground level," I will refer to the former with a plus and to the latter with a minus sign. Measurements are given to the bottom of the graves whereon the skeletons lay.

One of my early excavations was a long trench east to west through the center of the Big East Mound. Prior to 1898 an excavation had been made there by someone, and I encountered parts of several skeletons at +42″, the foot-bones of one having been left undisturbed in the bank. The old excavation continued down to the Ash Layer but not through it, the hard tough layer evidently having proved too much for the diggers. Passing through this into gravel at −12″, I noticed a slight discoloration at one point and dug there, finding EM 42 a male adult at −30″. The skull like all others lying deep upon the left side, was crushed laterally and twisted diagonally to the face, requiring considerable mending and some restoration. The bone texture of these gravel burials is hard and finely preserved, the color ranging from cream to very light brown. EM 42 being a good male specimen and my first meso in a semi-concealed grave below ground level, I have made it a type, representative of the group. There seemed to be small chance of finding another under it as I dug deeper, for there was no sign of dirt, nevertheless at −50″ under the foot of EM 42 there appeared a skull EM 26; and as it was a crouching long-head, I have made it a type of the deep long-head group. I secured the head and one clavicle and then undercut where the balance

of the skeleton lay fast in the bank. Our enforced method of excavating and then filling in each day's work made operations hazardous at considerable depths, as shown on this occasion. The wall of dirt over 11 feet high, counting the earth around the rim, contained part of the old excavation on one side and could not support itself. Slowly it toppled inward and I was fortunate enough to see and jump clear just in time. This was but the first of other similar experiences in some of which I did not escape so easily. Fortunately I had a dependable assistant to dig me out, illustrating how advisable it is to refrain from excavating Indian mounds alone. Close to the head of EM 26 were four rough flints that I should ordinarily not consider as made and used by human hands. However, they are "worked," and as the gravel has yielded no flint elsewhere, the four pieces at least deserve mention.

In the Big West Mound, a Round-head WM 70 with pot at +24″ lay diagonally over an adult WM 73 at +12″, the latter wearing a copper plate disc over each ear. WM 73 in turn was partially above WM 76 a female Long-head at −30″. The Ash Layer and its two enclosing seams were intact over the last-named skeleton. Its head, left side down, rested upon a mosaic of limestone pebbles, apparently chosen to a 1 inch size. In the center was embedded a small stone block veneered with some green stone, plate X, c. No doubt the block was chosen for its symmetry and oddity. It bore no marks of fabrication. Another interesting feature of this burial was the presence of two long-canaled, low-spired marine gastropods resembling *Fulgur* or *Tudicula*, resting upon the face of WM 76. They were notched around their slender bases and no doubt were used as ornaments. This burial was accidentally exposed from the side, giving an excellent view of the skeleton in its gravel vault, the Ash Layer and its enclosing seams intact above and the Black Seam still higher, the wall section being nearly 9 feet high. In the upper four feet were traces of old filled-in burrows. One burrow still open had a live young woodchuck curled up in a grass nest at the bottom. It was in the month of November and the animal was so thoroughly asleep that after being removed, he was over an hour awaking and limbering up sufficiently to crawl away. There was the clear trace of another

burrow the like of which I have not observed in either of the two big mounds. It extended diagonally from the Black Seam to the Ash Layer and appeared to have originated at the former as it ended abruptly there, running down to the Ash Layer as a tube of grey sandy earth in brown pebbly soil. Within it was a complete skull and some bones of a mink. An infant skeleton lay close to WM 76 in the same grave. The interstices between stones enclosing the skeletons were tightly packed with finer pebbles and sand in a tenacious mass, and the bones were perfectly preserved, much more so than the skeletons WM 73 and WM 70 above. The WM 76 and EM 26 burials described were near the centers of their respective mounds.

Farther out, even near the rims, I found skeletons superimposed. One excavation half way between center and rim on the south side measured when finished 6 feet wide, 11 feet long, and 9 feet deep. Near the north end at the surface was the child with glass and kaolin beads previously mentioned. It overlay a second fragmentary infant skeleton, which in turn was superimposed upon a third immature skeleton at +24″ in the Black Seam, with a small loop-handled pot containing a clam-shell spoon. A fourth child's skeleton lay near the third. Under the feet of the latter at +15″ and above the Ash Layer were two lone adult skulls without lower jaws, both brachycephals—one a male, EM 37; the other a female, EM 38. EM 37 had a small triangular chert arrowpoint lodged in the left temple. This skull directly overlay an infant skeleton, EM 40 at −12″ beneath a 5″ bed of ash dirt, with a small clay pot near the head. Beside EM 40 was a narrow-faced female roundhead EM 39, plate X, b, a prone burial with face looking to the east. A peculiar stub-handled clay pot containing a clam-shell spoon lay near the skull. I removed the skeleton, all of whose bones were in place and continued down into apparently undisturbed limestone gravel. It seemed a waste of effort to go deeper but I did; and at −36″ directly below EM 39, came upon a longhead EM 41, a crouching burial lying east and west accompanied by an infant's skeleton. Such unexpected finds as EM 26 and EM 41 led me to dig deeply in succeeding excavations and with considerable success.

In another excavation near the rim on the west side of the mound an adult meso EM 78 at +18″ was superimposed upon a child EM 79 with grit-tempered pot buried at +6″. The latter overlay an adolescent broad-head EM 80 at −12″ with small triangular chert arrowpoint under the head. At −36″ was an adult broad-head with a fine pot disturbing an adult long-head EM 81, the latter more than 42″ below ground level. Directly south of this excavation and near the rim, an adult and adolescent, EM 95 and EM 94 both round-heads, were side by side −30″ deep. An adult round-head EM 96 was near by 6 inches deeper, almost directly overlying EM 98 an adult long-head in a concealed grave at −48″.

In the Big West Mound, an excavation on the south side near the rim yielded an adult WM 41 at +18″ directly over a second EM 38 +6″ which in turn directly overlay a third WM 39 on ground level. WM 38 is a round-head adult male, the bones showing powerful musculature. Under WM 39 at −30″ was a round-head WM 40 half upon its side, the grave being filled in with grey dirt. Of 8 skeletons found in this hole, one WM 42 at −24″ was a long-head in a concealed grave with no burials directly above it.

These were cases of graves directly overlying each other. Frequently although direct overlying did not occur, a chronological succession was apparent. On the northwest border of the Big East Mound, an adolescent EM 76 lay prone in grey dirt near the surface nearly 3 feet above ground level. The hole measured 10×7 feet. EM 76 was at the center, head south, feet north. A mantle of stones covered head and shoulders. At +24″ close to the east wall, +15″ near the west and extending unbroken through the excavation was an irregular sheet of compact black earth with occasional patches of pebbles. Beneath this near the east wall were two prone brachycephals, EM 69 and EM 70, at +12″, both with clay pots near the heads. They lay in hard brown soil coarsened with fine gravel. In the northwest corner was an ash-bed 5″ thick, its surface at −6″, continuing unbroken through the rest of the hole as a grey dirt and gravel layer so compact as to resemble soft concrete. Beneath the ash-bed and on gravel at −18″ was a prime female adult broad-head EM 72 with a fine, large "antler-

point" pot. In the southwest corner at −18″ was a child EM 70 with a fine, small "antler-point" pot. A slight discoloration in the southeast corner led me to dig there and discover two adults EM 74 and EM 75 in sprawling attitudes without pots or artifacts. The two skulls were much crushed and difficult to measure correctly, but EM 74 appears to be a meso, and EM 75 a round-head.

Occasionally one burial disturbed its predecessor. EM 117, an adult at ground level, had considerably disarranged a round-head EM 116, 3 feet beneath, and a second, EM 115, slightly. These last two lay upon their sides close to and facing each other, their heads pillowed upon clustered artifacts of stone, chert, bone and antler, the largest collection found in any grave of either mound.

Mortuary Customs

In the Upper level, disturbed conditions made it impossible to determine notable characteristics. Artifacts were few and the skeletons lay in various positions mostly irregular. In the Lower Level, all mesos lay in irregular postures, although always upon their sides, the long-heads also upon their sides but studiously arranged with knees drawn far up and arms bent with hands beneath the chin. Mesos and long-heads both had their backs to the south, heads west. The arrangement of pebbles beneath the head of WM 76 has been described. Its appearance was striking, as I was fortunate enough to get a glimpse of it before any of the stones were disturbed. It was a mosaic of 1″ limestone pebbles with an odd stone block in the center, all made level for about 9 inches in diameter. The left side of the skull lay on the center of this mosaic. EM 98 previously discovered had, I believe, a similar arrangement but the skull was difficult to see and reach and I did not suspect that the pebbles all of one size had been placed there for a purpose. The broad-heads lying beneath the Ash Layer of the Middle Level lay flat upon their backs with arms flexed and legs straight or bent sideways. The majority had their heads west, feet east. Each grave was dug no more than large enough to contain the body, and filled in with grey pebbly earth up to the base of the Ash Layer. Every broad-head had a pot or artifacts, and so did some of the round-heads though many of these were without

relics of any kind. Clay pots were placed above or beside the heads, the latter occasionally resting upon small caches of artifacts. No skeleton in either mound had artifacts any lower down than the breast-bone. Pots accompanied female adults and children, the latter generally having small pots and adults medium to large. In eleven cases bones of one hand were within the pots, all being burials of children.

With few exceptions, pots contained clam-shell spoons encrusted with a tenacious and gritty brown film. Bits of bones were in many of the pots which seem to have contained broth or stew. Undisturbed burials had all of the bones in place. None had come in contact with fire or suffered mutilation. No foreign earth appeared. Occasional blotches or red pigment appeared upon the skulls, staining the gravel beneath them. Several stone celts in contact with yellow pigment are etched as though with acid.

Between the Ash Layer and Black Seam, some of the adult skeletons had dense, shiny patches over their heads, apparently black earth mixed with decomposed animal matter. While some of the bones in the Ash Layer were burned, others were not, nor did the adjacent seams or even the hard dirt patches in the Ash Layer itself show trace of burning. There were no signs of altars, except possibly in one instance where a hole had been dug in gravel about three feet round and one foot deep and filled in with ashes. In the latter were a human radius and ulna unburned. The gravel around this cavity was reddened by fire. This was at the western rim of the Big West Mound. I could not find a single burial originating beneath the Black Seam that was not in a hole dug for the purpose. Above that were some skeletons that appeared to have been simply laid down and covered over with stones and dirt, although I am not certain of this. I am certain, however, that there were no bundled burials or cremations.

Burials of the Middle Level

Male adults were scarce, and the first one found I have taken as a type. This individual EM 19 lay in gravel at $-18''$, head west, feet east. The head of the right humerus was much eaten away by injury or disease, and that bone was shorter than the left. On the right side beneath the chin were 14 much decomposed antler points,

probably the remains of a necklace, for they were too curved to have been used as projectiles. Near the right ear was a leaf-shaped chert blade; close to the right shoulder, 6 small triangular chert points and one long slender point. About 6 inches farther down was a polished stone "celt." The 8 chert pieces were placed points upward. After light brushing they and the celt showed long dark discolorations in the gravel, which I interpreted as the remains of wooden shafts to which the pieces were lashed. I merely infer this, for not a particle of wood remained. The lengths of the arrow shafts were about 21″, the celt 15″ and less than 1″ diameter. The leaf-shaped blade showed a half-inch or more diameter, but I could not trace it under the skeleton. Apparently the stone relics represented 7 arrows, a lance and a tomahawk. The skull of EM 19 has a cephalic index of 86.7. The forehead sloped rather strongly, the back of the head is flattened and the sides bulge outward. In no other burial were there any signs of wood in connection with artifacts.

EM 2, a young female adult, another broad-head in gravel, had an otter skull and jaws resting upon the forehead. The rear part of the otter skull was cut or broken off. Below the chin was a large shell bead; at the ears two thin copper discs which had stained each temporal bone green. This was a prone burial—head north, feet south. Near the top of the head was a pot made of clay mixed with pulverized shell. This pot was beside the head of the skeleton. It is 7¾″ diameter and 6¼″ high, globular, low-rimmed and with constricted neck. The decoration is of a kind that I define as "antler-point."

EM 21, a prone adolescent round-head with projecting face, had a small grit-tempered pot near the left shoulder, a pierced clam-shell pendant upon the breast-bone and some tiny copper plate beads below that. In the double burial EM 115-116 with 117 encroaching, bone and stone artifacts were pillowed under the skulls, and among the implements were bones of animals bearing no marks of fabrication. Many skeletons were unaccompanied by relics of any sort.

In previously disturbed areas with no ash layers above them were several mesos and long-heads. These were crouching burials

above gravel. In direct contact with each, the earth was absolutely free from pebbles, blue black and shiny as though containing clay. The skulls were badly distorted. Three in the body of the mound, EM 83, 101, and 102 seem to be mesos, although measurements are uncertain because of the warped condition of the skulls. EM 83, a young female adult with new-born infant, had a small triangular chert arrowpoint under the left clavicle and a bored round bone point between the left radius and ulna. Close to the head was a crude celt-like stone tablet with 10 bone cylinders adhering to it, cemented there by a tenacious gritty substance. EM 101, a female adult with knobbed grit-tempered pot, appears not to have been quite dead when buried. One arm had crushed the pot, and the hands extending downward were clenched around hard lumps of pebbly earth. The heel-bones had moved forward making grooves in the coarse soil which showed two small piles when I swept the skeleton clean. EM 100, a young female adult, lay in a crouching position, with an infant beside her. This is a long-faced, narrow-nosed long-head. The soil above was disturbed by a previous excavation, and the grave could not be traced upward.

EM 125, plate X, c, a young female adult round-head prone in gravel at $-18''$ at the southern rim of the Big East Mound, had an infant at her left elbow. WM 66, a like case in the Big West Mound, had two infants, plate XI, c. WM 49, a male adult round-head at $-12''$, was accompanied by 3 small triangular chert arrowpoints and a small but interesting collection of bone artifacts, all beneath the head.

WM 45, a half-grown round-head child, was in a funnel-shaped cavity extending down to two feet below ground level and filled in with black dirt free of pebbles or sand. The skeleton lay in this dirt at $-12''$. The head had become detached and was $18''$ higher up encased in a complete deer antler, whose four points had been cut off and the stumps split away for several inches down, making a tool of some sort which showed considerable use.

Artifacts from the Two Big Mounds

Although prolific in pots, the collection does not contain a particularly large number of ornaments and implements although

there are enough and sufficiently varied to make comparisons with similar relics from other localities. Articles used for adornment appear very crude in contrast to those employed for obtaining and preparing food. Art in any form appears solely upon the pots. The latter make a fine collection which will be difficult to duplicate in this region, where whole specimens are practically unknown.

Before discussing the various relics in detail, negative evidence may be considered, for many things that I expected to find, and searched for diligently, were conspicuously absent. There was no sign of grain nor any tools which suggested cultivation of the soil. No seeds or fruit-pits appeared, nor were there any traces of perishable material, such as cloth, hide, hair, woven reeds or wood with a few exceptions. Apparently the people, of the Lower and Middle Levels at least, subsisted upon fish, flesh and fowl. Of cloth, the only suggestion is a small piece about 1 inch square which appears to be coarse matting. It adhered to one of two copper ear discs on the face of WM 73. These discs heavily encrusted with green oxide, had also preserved two round flat and pierced buttons made of leather or wood, discs, and buttons evidently having been fastened together and used as ornaments. In two other instances the buttons had been preserved by contact with the copper discs. Of three copper bead necklaces, the string holding them together was recognizable although reduced to powder. Of wood, I found several small chunks in the Upper Level. These were too soft to handle. Small crumbly pieces of bark lay embedded in the Ash Layer. Near the skull of EM 26, its top below ground level, was a stub 5 inches in diameter and 30 inches long standing on end. This stub was not soft, rather hard and brittle like a walnut shell. Marks of hardened grease appear in some of the clay pots, and the shell spoons are frequently encrusted with a hard, gritty brown film. Some of the bone artifacts have particles of gritty film adhering to them, tenacious enough in several instances to fasten various articles to each other. The dog is the only animal observed that can be considered domesticated. It occurs in the Upper Level but not with certainty below, and I find no sign of it beneath the Ash Layer. The bison is absent. Of chipped stone implements, no notched or stemmed piece occurs

below the Black Seam. The polished stone implements are celts only. Grooved axes and clubs, pierced tablets, effigies and other polished pieces which are occasionally picked up in neighboring localities, remain as yet undiscovered upon the Fisher site. Pipes, too, are absent, at least I have found none, either of stone or clay, in any of the mounds. The objects to be enumerated are clay pots, and artifacts of copper, shell, stone and bone. All measurements are in millimeters.

Clay Pots

Of the pots secured from the two big mounds, only about 6 can be assigned to the Upper Level and as these lay in previously excavated areas, their true position may possibly be at the top of the Middle Level. The remainder were from the Middle Level, some of them so long crushed that fragments had disintegrated. A few were undamaged, others broken but readily mended and restored. In form they are globular with sharply constructed necks and low rims, the latter occasionally almost vertical but generally flaring outward. In size they average 190 mm. in transverse diameter and 140 mm. high, the breadth exceeding the height. Many are shell-tempered; in others the clay was mixed with crushed crystalline rock or chert. The few pots from above are small, the largest one measuring 127 mm. in diameter and 82 mm. high, being with skeleton EM 101 beneath the Black Seam, plate XII, a. The outer surface is smooth except for knobs around the shoulder made by pressing the moist clay from the inside with the finger. There are six of these knobbed pots, plate XII, b. Between the Black Seam and Ash Layer the number of specimens increase and they are finer than those above, the technique improving downward into gravel where the larger and finer pots were found. Most of these are shell-tempered, others rock-tempered. This pottery is as a rule fragile, from 3 to 5 mm thick at the bottom and 1.5 to 3 mm at the shoulder. Most of it is sun-dried or only slightly burned, although a few pieces are hard and brick-like. Outwardly the color is grey or light-brown. The inside surface is frequently pink, possibly occasioned by food within that contains grease, plate XII, c. Small pieces of bone were in many of the pots.

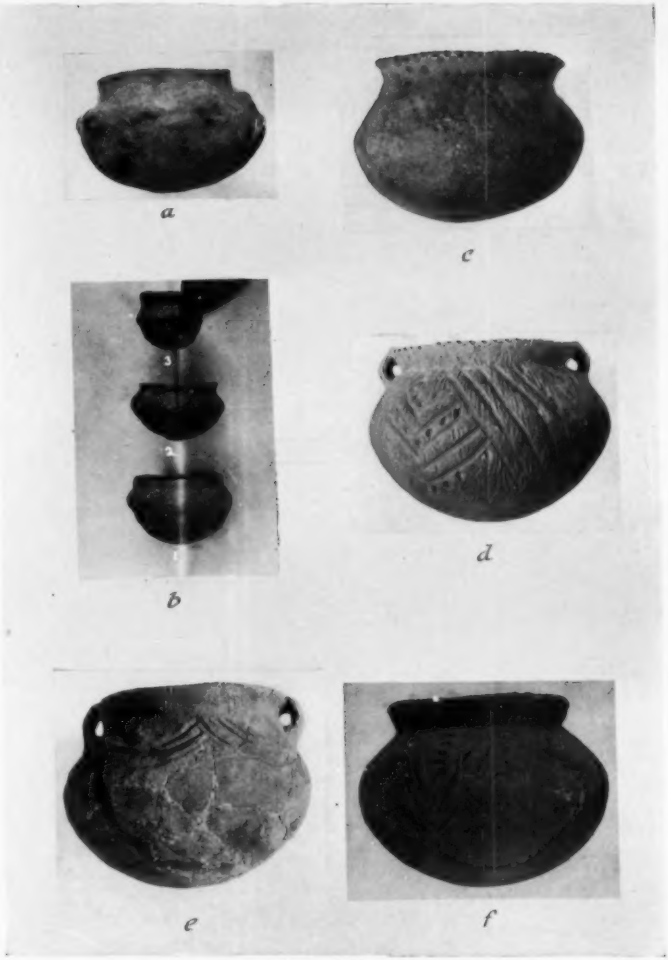

PLATE XII

a. EM 101. Adult meso burial in Zone I of Middle Level. The largest of the "knobbed" clay pots. 1/4. b. Small "knobbed" pots; 1, WM 62, 2, EM 92, 3, EM 112. 3/16. c. EM 12. Big East Mound. Same level as "antler point" pots. A pinkish mineralized grease-line extended about half way from bottom around the inside. 1/4. d. EM 3. A fine typical "antler-point" pot from Middle Level slightly in gravel; shell-tempered. Zone II. 1/4. e. 3EM 14. "Antler-point" pot. Zone II, Middle Level. 1/4. f. Fine example of shell-tempered "antler-point" pot from Zone II of the Big East Mound. 1/4.

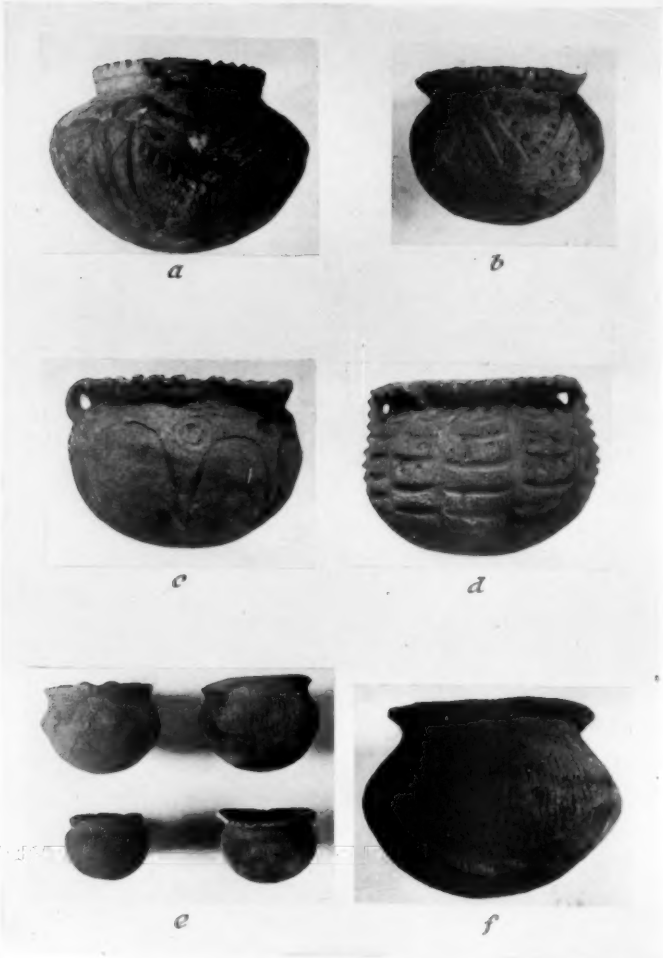

PLATE XIII

a. EM 72. "Antler-point" pot with skeleton female broad-head. Shell-tempered. It has two broad loop handles. All of this type of pot contained carved clam shell spoons. Zone II, Middle Level. 3/16. b. EM 5. Big East Mound. "Antler-point" pot below average size. Shell-tempered. +1/4. c. WM 53. Shell-tempered "antler-point" pot from Big West Mound with prone female adult. Zone II of Middle Level. 1/4. d. WM 58. With prone female adult round-head. One handle is broken off. Otherwise this pot is undamaged. 1/4. e. Big East Mound. The two shell-tempered pots at left from Zone I, Middle Level. The two grit-tempered ones at right are from the Middle Level above gravel, Zone II. The left upper corner figure is one of the "knobbed" pots. It and the one below bear crudely incised decoration. 3/16. f. EM 15. Big East Mound. Grit-tempered, above gravel. 1/4.

The largest and finest specimens accompanied brachycephals buried below ground level. I call them "antler-point" pots because of the ornamentation around the shoulder, plate XII, d, e, f, plate XIII, a, b, c, parallel rows of meanders or festoons interlined with dots, or right and left diagonals in parallel in combination with lines, dashes or dots. These lines about 3 mm wide are impressed with a blunt-pointed instrument, possibly an antler-point, many of which occurred in the two big mounds or near them. Under one skull, EM 115, were a round iron-clay stone, polished and flattened on one side, several antler-points and a spade-like piece of large antler, all of which suggest usage in the making of pottery. A rather common form of decoration was a single meander around the shoulder, impressed with the finger. Potsherds were numerous between the Black Seam and Ash Layer, many of them quite unlike the burial pots, in that they are coarser and thicker and differ in rim shape and decoration. The differences may be merely utilitarian, fragile "antler-point" pieces serving as mortuary vessels and the coarser ware being used more commonly in camp life.

The majority of pots lack handles, but many have two, one opposite the other, plate XIII, d. These are short loops of round or elliptical section. Occasionally lips or lugs appear instead of loop handles. The rim edge is usually indented or crenulated, done with a tool or the fingers. Many of the "antler-point" specimens are rather artistic—round, symmetrical, and attractively decorated. However, as works of art they are entirely aboriginal. The small knobbed pots from near the Black Seam are smooth-surfaced with the exception of two which bear crude incised decoration. None have the roughened surface prevalent in the Middle Level, plate XIII, e, an external finish which may be confused with "cord-modelling" or marks made by patting the clay vessel while moist with a cord-wound stick or paddle. On some of the pots, there seem to be occasional marks of twisted cords; others have a very rough bark-like surface which may have been done by brushing rather than patting. See plate XIII, f. I find no impressions of nets, matting or cloth on any of the specimens. In only three examples do I find any departure from the globular low-rimmed pattern. EM 39 with but one stub-handle resembles a stew pot, plate XIV, a.

It is thick-walled and undecorated. EM 114 although globular-bodied has a high neck without beaded rim, sloping inward, plate XIV b. EM 64 has a rather high neck and is elaborately decorated with diagonals, horizontal lines, and dashes, plate XIV, c. Neither animals nor human beings are portrayed, face or figure, on any of the pots or artifacts. The grit-tempered pots are not so elaborately ornamented. The largest one EM 24 is 245 mm in diameter and 152 mm high. The largest "antler-point" specimen, EM 72 measures 235 mm by 165 mm. In the reconstruction of broken pots, plate XIV, d, I use the same method as with fossil animal bones, cementing the fragments together and filling in gaps with tinted dextrine plaster, plate XIV, e. This process requires patience, but results in a durable restoration no matter how thin or small the fragments may be. One specimen, EM 36 showed an aboriginal repair job. A hole about 8 mm diameter had been accidentally punched through the bottom and the damage remedied by burning on a patch of clay over the hole from the outside.

The potsherds of various neighboring localities seem to be of two kinds which occur together: coarse rock-tempered pieces with low necks and bark-like surfaces; and extremely coarse and thick high-necked pieces with large crystalline tempering medium, brick-red burned and bearing punch-stamped and rouletted decoration, plate XIV, f. Among the thousands of fragments found in and around the mounds, not one resembles this last-named variety so common elsewhere.

Copper

This metal appears sparingly in the Upper Level and is not common in the Middle. See plate XV. Above are a few plates bent into small hollow cones; below a few implements and ornaments, heavily encrusted with green oxide. I found 3 copper celts in the Big East Mound. These were in the east to west trench wherein was the long-head EM 26, and lay between the Black Seam and Ash Layer beneath human bones disturbed by a previous excavation. The longest measures 102 mm, the shortest 83 mm, and the thickness varies from 6 to 10 mm. The adolescent EM 21 in the Middle Level with tiny plate copper beads below the

PLATE XIV

a. EM 39. This odd-shaped, thick, shell-tempered pot lay close to the skull of a narrow-faced, round-head female in Zone II of Middle Level, directly over the deeply buried long-head, EM 41. 1/4. b. EM 114. This high inward sloping neck is unusual. The pot is thick-walled, shell-tempered and ornamented with circular indented lines 3/16. c. EM 64. This is an unusually high-collared "antler-point" pot, shell-tempered, brick-red. 1/4. d. EM 71. Some of the pots were badly crushed but I collected all of the pieces and eventually restored the specimens. Middle Level, Zone II. 1/2. e. EM 71. This pot of the Middle Level, Zone II was badly crushed when found and had long been so. I finally got it together as shown.—1/4. f. Stamped and rouletted potsherds. Such coarse, brick-red high collared grit-tempered pieces are not found on the Fisher site. These came from the point of land where the Des Plaines and Kankakee Rivers meet a mile or more below Fisher's and were accompanied by large stemmed and notched flint arrowpoints. 1/2.

PLATE XV

Copper artifacts

The three top copper celts are from the Middle Level of the Big East Mound. The two bead necklaces are from the Middle Level of the Big East Mound. The larger one was with a child WM 14. At right center is a copper nugget with broad-head, EM 31 in the Zone II of the Middle Level.

The two plate cones at right were in the Upper Level or top of Middle Level. At bottom left are two plate ear discs and above them a leather button to which one of the discs was attached.

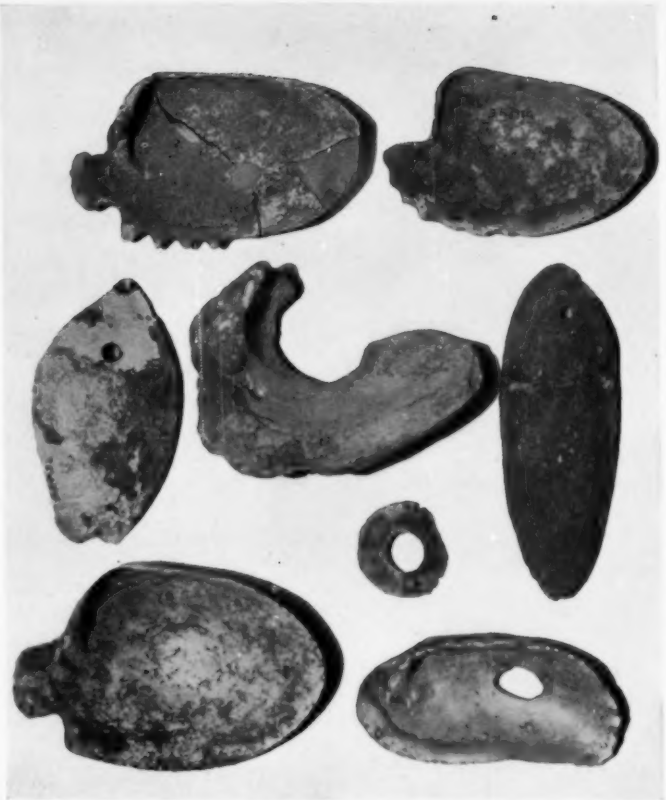

PLATE XVI
Shell (3/8 size)

The two top and bottom left corner figures are spoons carved from clamshells and found in clay pots. Zone II Middle Level.

The center figure is a thick clam-shell with 1" round hole in center. Each side of this is a pendant. The one at right was on the sternum of a round-head child EM 21. The small circular piece below is a pendant from the neck of a child WM. All the above are from the Zone II of Middle Level.

At bottom right is one of many clam-shells with rough holes in them—from the diggings in Zone II Middle Level.

breast-bone has been referred to, as have female adults with thin copper discs so close to the ears as to stain the temporal bones green. A two-ounce nugget of virgin copper under the skull of a broad-head, EM 31, would indicate that implements were made upon the site from raw material obtained elsewhere. EM 127, a prone adult brachycephal on gravel, wore a necklace of copper beads, each bead plate rolled to a tube about 12 mm long and 6 mm diameter. WM 14, a round-head child in the Big West Mound, had a similar string in which the size of beads varies greatly. In these two cases, also in a third, the ornament encircled the neck. The Southwest Mound produced four large tube beads.

Shell

The occurence of marine gastropods fabricated into ornaments is interesting. See plate XVI. The long-head WM 76, deep in gravel as has been noted, had two of these shells, notched around their lower extremities. These were touching the face. With EM 98 was a small tube 49 mm long and 6 mm diameter; the column or central part of a marine gastropod. Two other shorter and thicker shell beads were at the throats of broad-heads in the Middle Level. These may have been made from thick river clam shells. They are largest at the center, tapering to both ends. At least four species of clams abundant in the Des Plaines River served as food for the aborigines and some of the shells were fabricated for use. Seventy-five per cent or more of the clay pots contained shell spoons, the hinge portion being trimmed down and the large and double-notched to form a stub handle. Several were scalloped on the lower margin and one had four long prongs which made it appear like a combination spoon and fork. In some of the less deeply buried pots the clam-shells were uncarved and might be considered unutilized except that each reposed within a pot. Many of them bear brown gritty encrustations.

I secured shell pendants from three burials, all placed upon the breast. Two are pierced with tiny holes at one end, and all three have 2 larger holes in the center. Two are of elliptical form, the third is circular. Various problematical fragments accompanied skeletons in the Middle Level.

In the diggings between the Ash Layer and Black Seam were numerous clam-shells, most of them whole, others broken in pieces or with a large rough hole through the center. It may be that the aborigine treated a clam as we do a nut, breaking into it to secure the contents. One very thick shell had a large round hole through it, the upper portion cut away and the lower border much worn. This had evidently been used as a tool of some sort, probably a scraper. Shells of land-snails were common in the diggings, but none show marks of utilization.

Animal Bones

These occurred abundantly in the diggings. See plates XVII and XVIII. Deer bones were the most common, and among these the scapula predominated. Only the articular end was preserved, although the blade could occasionally be recognized by splinters. Foot-bones were plentiful; the upper ends of humeri and femora absent. From the numerous specimens I have thus far identified the deer, elk, bear, canids, wildcat, otter, beaver, mink, weasel, skunk, raccoon, muskrat, rabbit, wild turkey, heron, goose, and soft-shelled turtle, and have recognized small rodents, birds, fishes, and turtles. Frequently unfabricated animal bones served as charms or for other purposes, being found beneath skulls in company with stone and bone artifacts. Often they so occurred in pairs. In the EM 115-EM 116 cache were two tarsal bones representing a wild turkey and heron, two deer astragali or anklebones, two incisor teeth of beaver, a mink's lower jaw, bird bones and several antler-points. Two wildcat humeri accompanied another skeleton. Turtle shells commonly accompanied broad-heads but are much disintegrated. Several of them show red stains, and one at least was pierced. Deer astragali were abundant. Although these are smooth, I have not been able to find one that bears unmistakable stamp of use. Deer and elk phalanges were cut off at the proximal end and hollowed for some purpose. Many such pieces in close association with the skeletons were doubtless used, contrasting with the numerous burned and unburned fragments scattered through the diggings between the Black Seam and ground level.

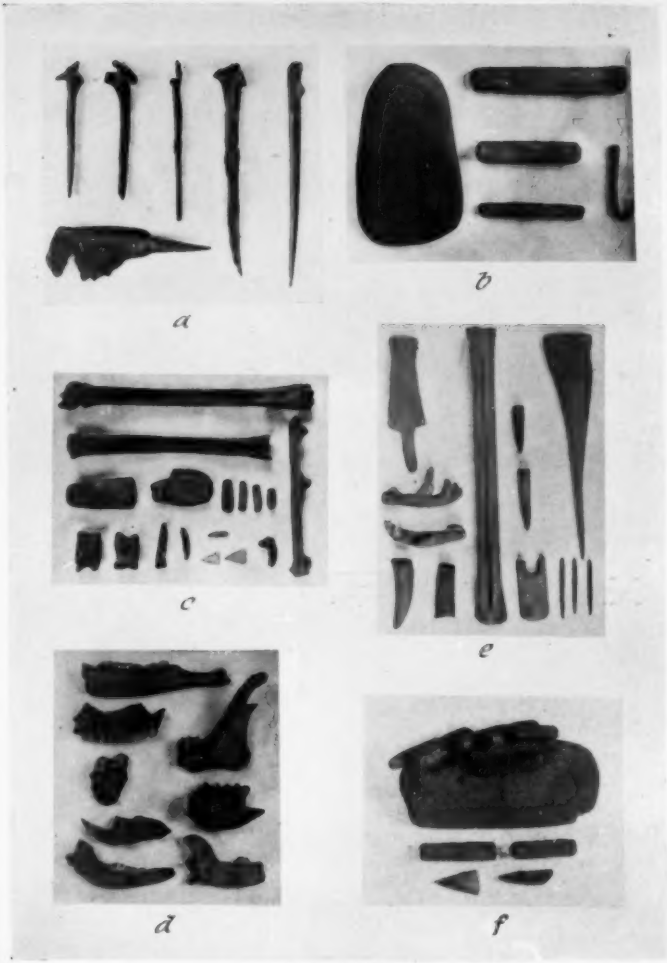

PLATE XVII

a. Bone Pins from under human skulls. The one at right (Raccoon ulna) is from Zone I, also one at bottom. The other four are from Zone II. 1/3. b. WM 49 Male round-head. Stone tablet and 3 bone cylinders, and bone fish-hook. 1/3. c. EM 115–116. Objects under skulls—in part. 2 long deer metacarpal draw-knives, a deer astragalus, 1 stone celt, 1 stone tablet with 4 bone cylinders, 1 antler point, 1 beaver incisor tooth, 3 chert arrowpoints, small mammal jaw and metatarsal bone of wild turkey. 1/8+. d. Animal bones from the diggings. The three upper figures are upper and lower jaw parts of deer. Below them are upper and lower jaw fragments of elk. In lower right hand corner is part jaw (of canid?) showing chopping marks. In left corner is jaw of dog with beaver jaw above it. 1/8+. e. Bone artifacts. The long central object is a deer metacarpal cut off at each end and holiowed throughout its length to two diagonal holes in the lower end. WM 49. At right is a long pin made from a deer scapula. Two bone arrowpoints are between them. In bottom right corner are three pegs notched around one end with a flat tablet to the left of them. In top left corner is a soft-shelled turtle costal plate found beneath the chin of a skull. Below it, two carved bear's jaws. Bored antler point and bored bone in lower left corner. 1/4−. f. EM 83. Stone tablet with 7 antler cylinders adhering (2 broken off). Side view.

PLATE XVIII

Animal bones buried with Human Skeletons. (7/16 size.)

Top center: Lower beaver jaw. Directly under it (center) is one of two deer-astragali with EM 115.

Left top corner: Part of pin made from a deer scapula. A similar piece is to the right of it.

Right top corner: Metatarsal of wild turkey with EM 117. To the left of it is a wild cat humerus, one of a pair.

Center: Mink's lower jaw. Below it at left is an otter's jaw with EM 2 and a raccoon jaw at right.

Left lower corner: Penis bone of raccoon. To the right of it is an antler point notched near end and a small mammal jaw with EM 115 to the right of that.

Bottom center: Fish jaw with two antler points to the right of it.

Bottom right corner: Fish spine with beaver tooth (EM 115) above it.

PLATE XIX (3/8 size.)

The smooth stone tablet and bone cylinders in lower right corner were with a meso EM 83 female adult in Zone I of Middle Level.

The other four pieces shown were under the head of the round-head EM 115. The flat piece at right, top, is antler; to the left a problematical piece made from an elk scapula. The two left are bone draw knives—all from Zone I or II of the Middle Level.

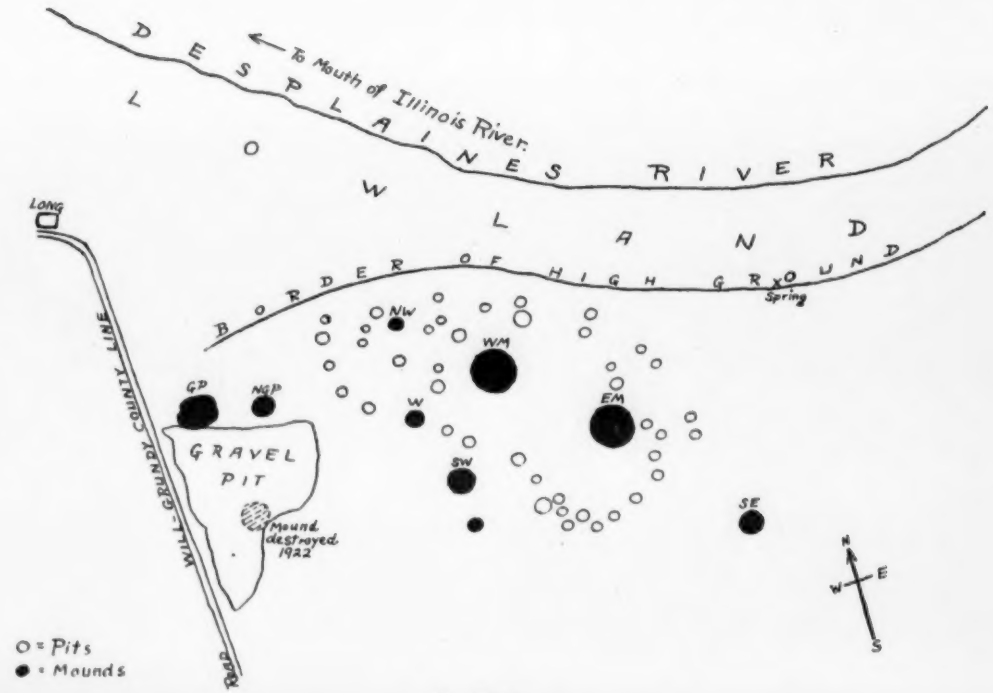

FIG. 1
The Fisher Mound Site, Will County, Illinois. Scale 1" = 150 feet.

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THE FISHER MOUND GROUP, SUCCESSIVE ABORIGINAL OCCUPATIONS NEAR THE MOUTH OF THE ILLINOIS RIVER

BY GEORGE LANGFORD

IN NORTHEASTERN Illinois, about 60 miles southwest of Chicago, where the Des Plaines and Kankakee Rivers converge to form the Illinois, is an old Indian village and mound site which after extensive excavation has yielded interesting disclosures. In this region evidence of aboriginal occupation is generally denoted by surface deposits of chipped flint, fragmentary pottery and occasional polished stone artifacts. More than one culture is doubtless represented but there is no way of determining this. The mounds to be described give opportunity for such determinations. Their outstanding features are:

Numerous superimposed graves arranged stratigraphically and culturally marking at least three occupations, with brachycephals above and dolichocephals below;

An intermediate pre-European culture prolific in small triangular chert arrowpoints, clay pots and artifacts of stone, bone, copper, and shell. Post-European objects are few and confined to the surface.

The locality, formerly part of the Cornelius estate in Will County on the Will-Grundy County line, is known as the Dan Fisher farm. It may be reached by automobile from Joliet on State Road No. 7, driving 11 miles to Channahon, then leaving the concrete and crossing the Des Plaines River over Smith's Bridge. From there the right-hand road follows the left bank of the river past Fisher's, the latter being about five miles beyond Channahon.

The Fisher Mound Site, Will County, Illinois. Scale 1" = 150 feet.

The Fisher Site

This site is a glacial limestone gravel deposit overlain by a veneer of dark surface soil, with sandstone and clay of the Lower Coal Measures beneath. The land is about 30 feet above the Des Plaines River and overlooks a lowland which extends from the

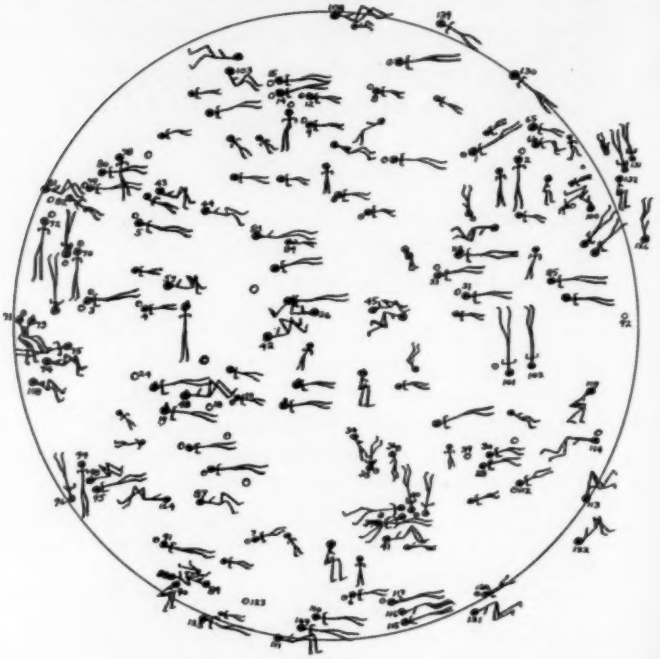

Fig. 2

Fisher's. Plan of the Big East Mound. Scale 5/64″ = 1′. Showing the human burials and clay pots, 0. Infants are the smaller manikins.

water inland 75 yards or more. 100 feet back from the low bluff's edge are two circular eminences: the "Big East Mound" 5 feet high and 50 feet in diameter, and the "Big West Mound" 6 by 60 feet. Near them are the smaller and almost unrecognizable "Small East," "West," "Southeast," and several other mounds

and around these are about 40 circular pits, from 15 to 30 feet in diameter, several feet deep and bordered by raised gravel ridges. Another group of mounds, or rather burial-heaps, originally three,

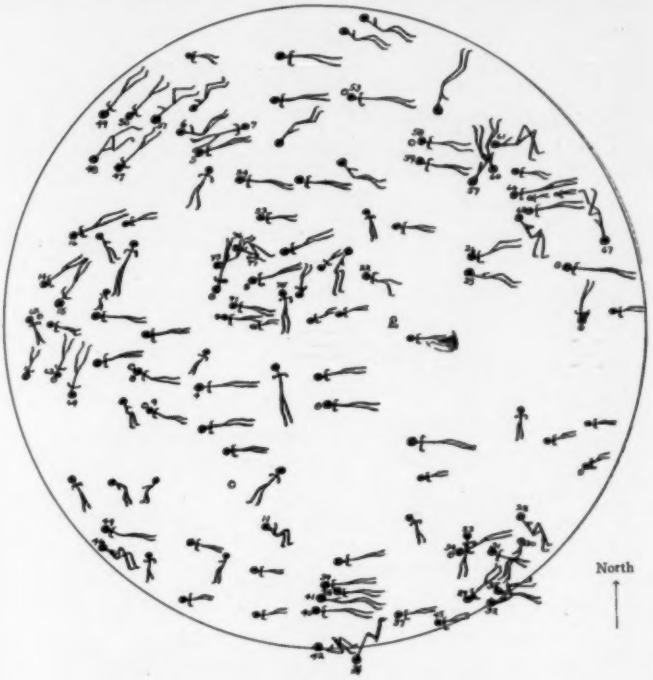

FIG. 3

Fisher's. Plan of the Big West Mound. Scale 5/64″ = 1′. Showing human burials and clay pots, 0. Infants are the smaller manikins.

now two, lies about 100 yards west of the two big ones on the Will-Grundy County line near a shallow gravel-pit made by the excavation of material for road-building. See map, fig. 1.

THE SMALL EAST MOUND

In November, 1906, Mr. Howard Calmer and myself, both of Joliet, were attracted to this spot by numerous colored glass beads

which a rodent had brought to the surface while burrowing. We dug into the center of the mound and at a depth of two feet came upon an adult male skeleton lying prone with a rusty iron knife, silver crescent and pendant, small glass beads, bits of cloth, a carved bone, pieces of copper plate, and several painted wooden sticks. The man's skull measured 181 mm long and 143 mm wide, cephalic index 78.9. The limb bones indicated a stature of about 5 feet 8 inches. A snow storm interrupted our labors, and next spring others, continuing where we had left off, discovered two more male and two female skeletons, the males being accompanied by numerous silver pieces: reliquaries, crosses, round brooches, pendants, bracelets and arm bands, also a small mirror, patched iron pot, pierced clam-shell, bone pin, cloth fragments, large glass beads, pieces of copper plate and one large stemmed arrow-point of pinkish flint. Several of the silver brooches were embossed "G.C." and "Montreal," denoting George Cruikshank, a Montreal silversmith of post-Revolutionary War times. The burials may therefore be dated at about the close of the 18th century. The skeletons all lay upon their backs and the bones resting in black soil were poorly preserved.

In 1912, hoping that there might be more in this mound, I again dug into it and after passing through the litter of previous exploration, came upon two undisturbed adult female skeletons buried in a foot of gravel 18 inches below ground level. Near the head of one of them was a small shell-tempered clay pot with bark-like surface. These were brachycephals lying upon their backs with lower limbs slightly bent. The mound, approximately 25 feet in diameter and 3 feet high, consisted of two feet of dark soil with a thin seam of grey compact gravelly earth beneath, overlying 2 to 3 inches of dirt and ashes. This lower layer contained charcoal, fragmentary animal bones, and clam-shells. The lower burials could be traced up to the ash layer but not above it.

For convenience I will hereafter refer to dolichocephals as long-heads, mesocephals as mesos and brachycephals as round-heads. When the cephalic indices of the latter exceed 85, I call them broad-heads.

The Southwest Mound

Mound-digging is not a pastime calculated to hold one's interest long as a rule—so I had learned from previous experience. A day's work invariably ended with nothing to show for it but a ruined disposition and an exhausted body. The discovery of silver and other European artifacts in an Indian mound inspired no more than my temporary interest; but the hint of what might be below them was impressive. Accordingly I sank two holes about four feet square, in the Southwest Mound which was slightly larger than the first one—about 30 feet in diameter and 3 feet high. One of these excavations yielded superimposed burials,—round-heads above, mesos below; all women and children. Believing that the Fisher site was well worth exploring, I endeavored to interest scientists in the work for which I did not feel justified in devoting my time and expense. However, I was unsuccessful in arousing material interest and so for another ten years the site remained undisturbed.

Work of Excavation

Until 1922 the mounds and pits had never been touched by the plow; but finally the ground-mound, pits and all, was ripped open and sown with wheat. In 1923 it was again cultivated for corn. This was too much for me. The two big mounds had so long been in my thoughts for the mysteries they might contain that after witnessing two plowings and foreseeing their ultimate destruction, I began work upon them in the fall of 1924, never dreaming, however, of the magnitude of the undertaking in which I became involved as I progressed. At first I had only intermittent assistance,—a temporarily interested helper one day, and another the next; but soon it simmered down to one man, Albert Tennik, Plate VIII, Plate IX, c, a Hungarian by birth, American by adoption, tall, powerful, and an indefatigable worker, who with continued experience became an expert. Actuated solely by interest akin to mine, he carried me on through a siege of painstaking and exhausting labor which I could not have long endured unaided. 80 days have already been spent upon the two big mounds alone and these are not quite finished. The other mounds and circular pits are only partially explored.

Our undertaking was not conducted in the manner I would have chosen, as we had but one day a week available and were not permitted to leave any open holes, each day's digging having to be filled in again. At first we feared that each visit might be our last, believing that Mr. Fisher, owner of the land, would not permit us to continue indefinitely; and so the need for haste prompted us to pass over many interesting details. Later, being secured from interruption, we used greater care and observed more closely, which we were glad to do because of the abundant material. I estimate that over 155 individuals were buried in the Big East Mound, 140 in the Big West Mound. Of these, I discovered 234 intact; 44 had been disturbed by previous excavations; and more remain. I have removed 70 clay pots; others were destroyed; and there are more left. In addition 90 human skeletons have come to light in the smaller mounds and around the pits. Numerous artifacts of bone, antler, shell, copper, flint and polished stone accompanied the human skeletons in the two big mounds. The diggings abounded in potsherds, clam-shells and broken animal bones. Graves filled the whole area of each big mound, one burial being superimposed upon another sometimes four high. What appeared at first a confused snarl, gradually untangled itself, when careful observation disclosed that the mass was really a composite of three or more levels, each defining a distinct human occupation.

Stratigraphy of the Two Big Mounds

My first visit here was in 1898 and when in 1912 I made a close external examination, the mounds seemed in no wise changed. See plate IX, a and b. In 1906 the Big East Mound stood about 6 feet above ground level at the crest. The latter had been dug into at several points leaving a shallow crater. The original height seemed to have been over 7 feet. In 1924, cultivation had reduced this height to 5 feet. In the ground around it, the black surface soil 6 in. deep became mixed with gravel for another 6 in., then changed suddenly to limestone gravel, light buff in color and absolutely free of dirt, the interstices between the large stones being filled in with smaller ones and fine particles,

PLATE VIII

Work on Big East Mound. George Langford (right), Albert Tennik (left). Rim excavation.

a

b

c

d

PLATE IX

a. The Big East Mound in 1912. Later I found the small EM 65 round-head under where I am standing. Beyond me, the Big West Mound and thorn-apple tree on it can be dimly seen. The mound height can be compared with my height. I am 6′4″ tall. b. The Big West Mound in 1912. G. Langford stands on the center. A thorn-apple tree grew from the northwest portion. The camera points a trifle north of west. c. Excavation of the Big East Mound, July, 1926. Working around the rim. G. Langford in foreground; Albert Tennik at right. The camera is pointed north. d. WM 11. No modern excavations appeared to have disturbed this skeleton and yet only the trunk was present. At the left shoulder is a crushed pot containing a shell spoon.

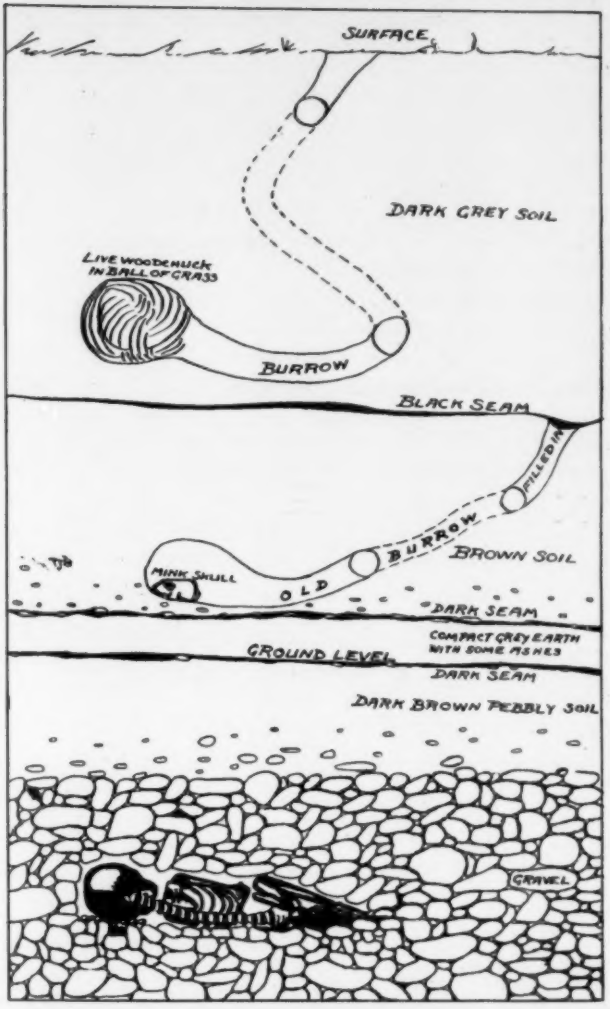

FIG. 4

Fisher's. Big West Mound. 5/8″=1′, 9 foot section looking north showing the female adult long-head WM 76 in gravel with infant WM 77 behind her. The head of WM 76 lies upon a pebble mosaic with small stone block in center. Two marine gastropod shell ornaments were touching the face.

almost coarse sand. This gravel is presumably late Glacial and derived from the Niagara limestone which outcrops along the Des Plaines Valley eastward as far as Chicago. Beneath the Mound the gravel deposit must be at least 20 feet thick. It overlies the clays and sandstones of the Lower Coal Measures, well-exposed about ¾ miles to the west along the banks of the Kankakee River. The mound's elevated position with gravel beneath, its sloping sides and compact structure, all went to make ideal drainage, a condition well-suited to preserve the contents. Of all the mounds I have dug into, this one far excelled in its facilities for the preservation of human bones and other semi-perishable substances in all seasons, dry or wet, warm or cold. Bones sealed in the gravel could have survived there indefinitely.

In 1924 the upper three feet of the mound was composed of rather loose dark surface soil. I arbitrarily term this the Upper Level. At its base was a dense black layer ½ to 1 inch thick, which seems to be composed mainly of vegetable matter almost mineralized. I call this the Black Seam. In places it thins out into patches of gravel, or thickens, but is ever present and continuous, almost to the mound's periphery, where it is several feet lower than at the center. Beneath the Black Seam is 1½ feet of brown pebbly soil, a hard, compact mixture of dark earth and gravel becoming coarser at the bottom. Below this is an Ash Layer 6 inches thick consisting in places of white ashes with bits of black charcoal above and coarse brown soil mixed with ashes below. Broken animal bones and clam-shells, both burned and unburned, are scattered through the mass, which instead of being continuous through the mound seems to be a collection of deposits one over each grave, the intervals consisting of very hard light grey earth mixed with pebbles. This layer, like the Black Seam above it, continues through the mound and is about 6 inches higher at the center than around the border. Its upper surface is topped with a thin seam of hard grey earth occasionally passing into patches of fine gravel. Its lower surface rests upon a thin layer of grey and brown dirt changing here and there to small gravel. This bottom layer is slightly above ground level at the mound's central

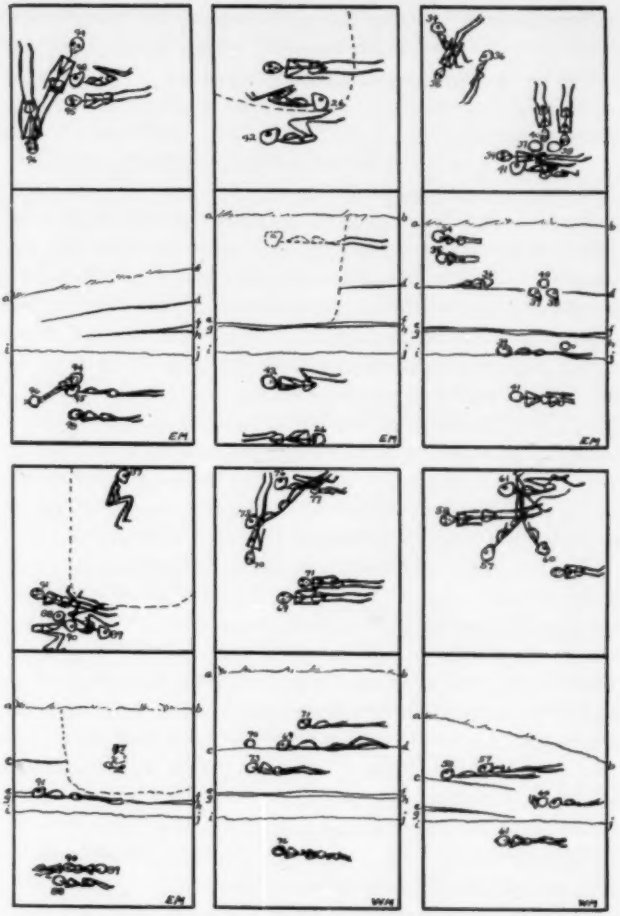

FIG. 5

Fisher's. Mound sections—all looking north—showing superimposed burials. Four are East Mound sections (EM); 2, West Mound (WM). Scale 1/4″=1′. The dotted lines denote old excavations.

a–b, Mound surface; c–d, Black seam; e–f, Top seam of ash layer; g–h, Bottom seam of ash layer, ground level; i–j, top of limestone gravel.

The top of each oblong is a plan, the bottom a verticle section of it viewed from the south.

area and from 4 to 6 inches lower around the outer portion. It rests upon 9 inches of brown pebbly and sandy soil, the latter in turn lying upon the main gravel deposit. The two seams enclosing the Ash Layer I came to look upon as the most important landmarks in the mound and I used them assiduously to locate the origin of every grave beneath them. Without such marks it would have been impossible to distinguish one grave from another; but as used, each grave could be followed upward to its place of origin and located stratigraphically. Inversely, the two seams invariably proved to be the determining factors, the oldest burials having both seams over them intact, the next oldest showing complete penetration through the lower seam but not through the Ash Layer or seam above it. With continued practice these observations were easily made and are, I believe, to be depended upon. The Black Seam farther up proved a third important landmark and I used it in the same manner as those below. There is no question in my mind but that the three seams enumerated are the main factors in this mound for determining its meaning stratigraphically and for finding the true relationship of one burial to another. My main task was to locate them correctly and not be misled by streaks and other local soil irregularities, a task requiring careful observation. My continued interest in the work lay largely in this phase of it,—the search for landmarks to find the place of origin of each grave. What with the numerous burials, I spent few dull or idle moments. Our first efforts were spent in what seemed to me a vain effort to arrive at some system of determining the meaning of various constant features persisting amid the apparent confusion and, until we learned from experience, we passed over things apparently of no importance but which we were careful to observe later; therefore the data on some of our early finds are incomplete and uncertain. As most of the human skulls were found crushed or distorted, not much could be learned from them until they were mended—a time-consuming and laborious process. However, even without skeletal evidence, certain peculiarities soon showed themselves.

In the upper part of the mound half way down to the ground level we learned to expect no important finds of artifacts, and the

skeletons lay in various postures, some upon their backs, others upon their sides, the limbs being in all positions. The few clay pots were small and knobbed around their shoulders, with little attempt at ornamentation. Flint and chert arrowpoints were the same as found upon the surface throughout the county, not small, and usually notched or stemmed.

On nearing ground level, skeletons invariably lay upon their backs and uncrushed skulls proved to be all brachycephals. More relics appeared with the burials. Knobbed pots gave way to larger and finer ones with considerable ornamentation of a certain kind that I call "antler-point," inasmuch as the designs appeared to have been engraved with antler-tips, of which I found many. With these were pots with rough bark-like surface, bearing little other decoration. Large notched and stemmed arrowpoints were replaced by small triangular ones, very thin and sharp and usually made of chert. Slightly above ground level, ash-beds were common, although in places we encountered grey dirt, so hard and compact as to resist any effort with the shovel and requiring the use of a pick. In some places ash-bed and hard earth blended in a continuous layer.

Beneath the ash-bed and below ground level were many graves clearly exposed by grey and brown pebbly dirt which contrasted strongly with the light buff limestone gravel deposit. These graves were easily found. The skeletons in them were all brachycephals, mostly females lying upon their backs and the uncrushed specimens showed unusually broad skulls. "Antler-point" pots were common, becoming larger and finer. Small triangular chert arrowpoints still prevailed, accompanied by a rude bone and shell culture.

Having learned that the finest pots, most abundant artifacts, and best-preserved skeletons were to be found near or below ground level, our attention centered there, for graves were very numerous. Sometimes we stumbled upon burials filled in with gravel instead of contrasting colored earth and no pots or artifacts could be found in such graves, nor were any of the skeletons lying flat on their backs. They were on their sides or half way on their backs or faces, and the few crania mended showed them to be

other than brachycephals; furthermore large males predominated. Some of these graves could be detected from above if examined very closely, the gravel texture and color above them being slightly different from the surrounding deposit. Other graves betrayed no sign of their presence after the closest examination and I simply dug deeper and found them occasionally, much to my surprise. I could recognize only mesos in the semi-concealed graves and long-heads in the concealed ones. These facts persisting may assist in explaining the importance I attach to the Ash Layer, particularly its enclosing seams above and below.

Each of the two Big Mounds had been casually excavated in several places prior to 1906, the holes being from four to five feet square but in no instance had they gone deep enough to reach the oldest burials in gravel. The Upper Level had served for a long time as an animal winter resort, the ground around the mounds being too poor in soil for the purpose. In December 1924 I encountered a woodchuck, garter snake and 6 lizards, all alive at a three-foot depth in the Big East Mound. I also found a sleeping woodchuck in the Big West Mound and traces of numerous old burrows in both. Many of the higher burials had been damaged by these inroads, plate IX, d, none of which however had penetrated the Ash Layer. Some of these old burrows contained bones of moles, rabbits, mice, and woodchucks which were often not readily distinguished from the numerous animal remains originally piled in with the dirt. These disturbances often made determinations difficult in the Upper Level, particularly in the Big West Mound. The latter, although much like its neighbor, contained a much larger amount of dark soil, which descended more than a foot below the Black Seam. The latter was 6 inches higher up, and the dirt between it and the Ash Layer was greyer than in the Big East Mound and with fewer pebbles. The Ash Layer, the two seams enclosing it, and all below were, however, much the same. The human burials in it differed slightly from the Big East Mound, however, in that only one broad-head appeared in the Middle Level, this deficiency being made up by numerous graves whose position is doubtful but which probably belong, some to the Lower and others to the Middle Level.

The Upper Level

After my 1906 experience with the small Southeast Mound, I expected to find post-European objects in the two big ones; but all that I did find was an infant burial with glass beads and a round silver buckle in each, plate X, a. These were near the center of each mound and close to the surface, representing all of the post-European artifacts observed. There were also some copper fringe-holders made of plate bent into small cones.

The upper three feet of both mounds had contained human burials, but plowing, previous excavations, and burrowing rodents had minced up the skeletons. Among the few badly broken skulls and bones recovered I found no individuals of unusual size although they were as a rule larger than others buried deeper. Conditions were more or less unsettled down to the Black Seam of the Big East Mound and in places from one to two feet below it in the Big West Mound, whose upper four feet contained more burials than the former. Consequently the place of origin of each grave was most difficult to trace, and when it could be traced frequently the skull was poorly preserved. However, I secured not a few fine skulls and bones assignable either to the Upper Level or to the top of the Middle Level. They are round-heads and mesos which appear to differ from the deeper skeletons, plate XI, d. In only one case, and that with some doubt referred to the Upper Level, were the human skeletons accompanied by artifacts, the latter consisting of five crude arrowpoints or rejects placed close to the head. These pieces were unstemmed and made of chert. Notched and stemmed arrowpoints occurred in the Upper Level of both mounds but none were directly associated with the skeletons.

The Middle Level

This section of both mounds abounded in human burials and relics,—clay pots and artifacts of stone, bone, copper and shell. Certain types of pots found above the Ash Layer did not occur below it. Above the latter was the great bulk of loose refuse, potsherds, chert flakes, clam-shells and splintered animal bones. In the lower portion, undisturbed except in a few instances, certain

characteristics persisted, in contrast to the confusion reigning above. Twelve skulls, the first ones mended, which I traced up to the top seam of the Ash Layer in the Big East Mound, are brachycephals. Six of these extended upon their backs and accompanied by pots, are broad-heads with cephalic indices ranging from 85 to 91. Of the other six, none had pots, the cephalic indices ranging from 80 to less than 85. All were in gravel lying irregularly without relics of any sort. The six with pots had artifacts of stone, chert, copper, bone, and shell. All the residents beneath the Ash Layer were comparatively small individuals. They lay on or in the underlying gravel deposit. The height-length, nasal, facial, orbital, and gnathic indices show the skulls to be rather high, noses medium to narrow, faces both broad and long, eyes medium to low and features somewhat prognathic. A characteristic of the Middle Level was the presence of small triangular arrowpoints, unstemmed and made of chert. Caches of 3, 6 and 8 were near the heads of skeletons, one long slender "drill-point" accompanying each lot. Not a single notched or stemmed arrowpoint appeared in this level although I found 18 above the Black Seam.

The Lower Level

The skeletons in this section were all buried in gravel, and as gravel with almost no dirt was used to fill in some of the graves, they were very difficult to detect. Others had not the slightest sign of dirt and their discovery was purely accidental. Of the first noted, the great majority lay upon their sides in semi-crouching positions, facing north, heads west, feet east, buried from 2 to 3 feet below ground level. All were mesos with high heads, narrow to medium noses, faces massive, eyes generally medium and features decidedly non-prognathic. Unlike the brachycephals, their lower jaws were powerfully developed posteriorly. Among them were the largest individuals in the mounds. Of the concealed burials 6 came from the Big East and 2 from the Big West Mound, buried 3 to 4 feet below ground level. All had long high skulls, narrow to medium noses, medium faces, low orbits and decidedly non-prognathic features. Two were

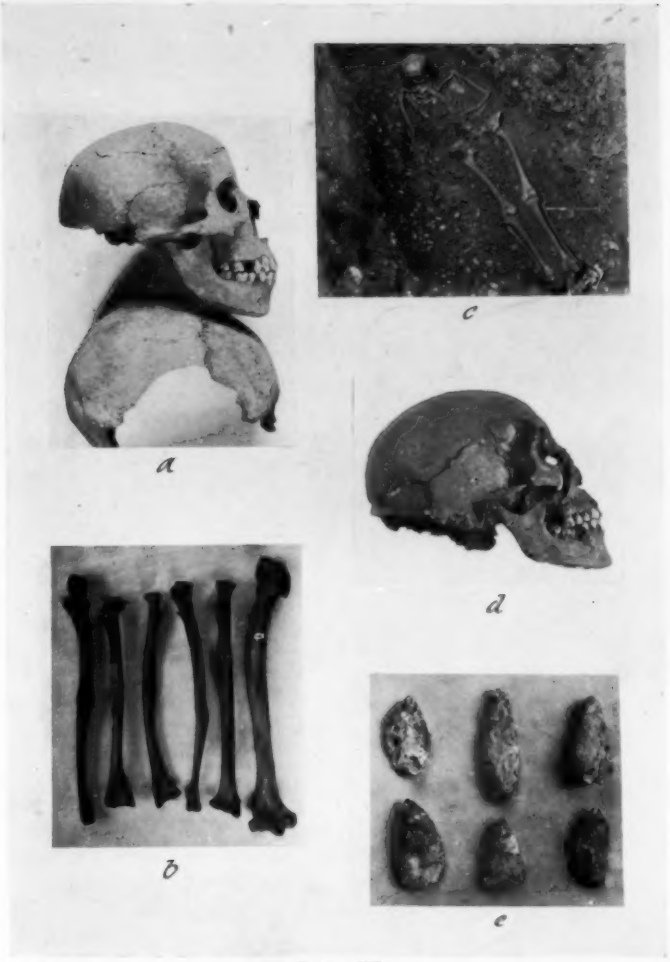

PLATE XI

a. The top skull is EM 21, a child with shell pendant, clay pot and tiny copper plate beads. Zone II of Middle Level. Prone burial with face to the east. Note the obtuse jaw angle and prognathic features. The lower cranium is SW 1, the only true long-head found outside of the two big mounds. 3/16. b. Human bones. Left to right: WM 15—broken ulna at center of shaft; WM 30-radius broken and healed at wrist. The center radius and ulna show curvature common to some of the skeletons. To the right of them is a broken and healed ulna, then a radius widened out at the shaft. The outer right hand figure is the humerus of WM 75 diseased at head and much curved. 1/8+. c. WM 66. Prone adult female round-head in Zone II of Middle Level. An infant was close to the right forearm and another near neck of right femur. The bones are visible. No relics with the skeleton. The camera is pointing northwest and down about 45°. d. EM 39. Narrow faced round-head female with stub handled pot. This burial directly overlay the deep long-head EM 41. Note the decomposed basal part of skull and the inclined lower jaw with obtuse angle. 3/16+. e. This cache of chert "rejects" was under the head of a male adult round-head, WM 67, at the base of Upper or top of Middle Level. 1/4.

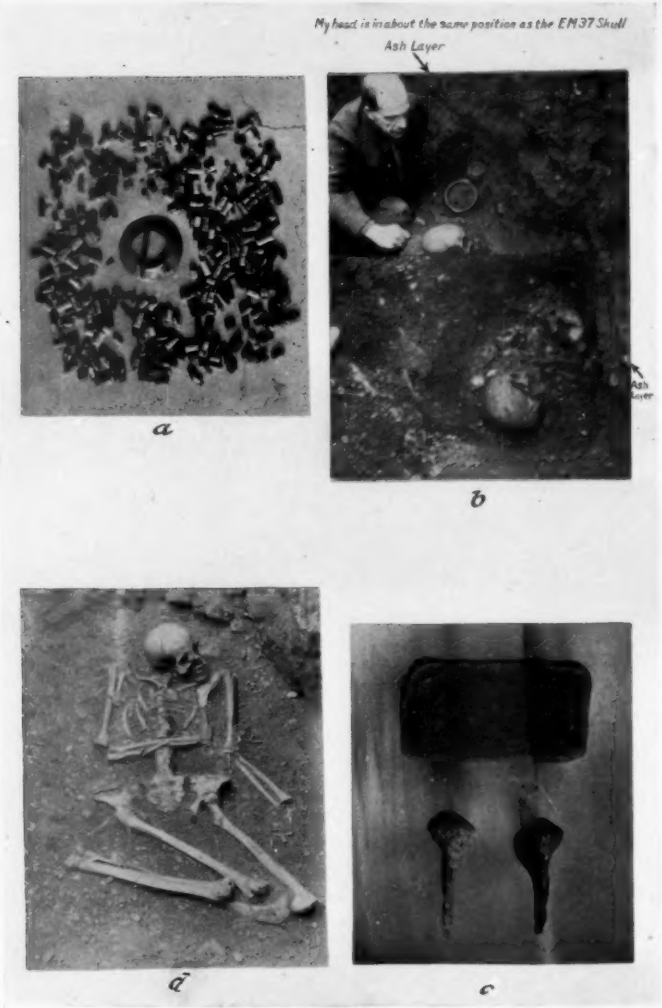

PLATE X

a. EM 34. Silver brooch and glass and Kaolin beads with child EM 34. Plowing had exposed these on the surface. No other Post-European objects appeared in the mound. b. Upper half, EM 39 with large pot and small pot. I have removed EM 39 skeleton. Camera pointing north and down. Lower half, EM 41 in gravel after removal of EM 39. Camera swung down to 60°. c. WM 73 with female long-head WM 76. The two marine gastropod shells were touching the face. The stone block, a pink stone with green veneer (gneiss?) is unfabricated but formed the center of a mosaic of 1″ limestone pebbles on which the skull rested upon its left side. 3/8. d. EM 125. Young female adult round-head. In the crook of the left elbow were the remains of a tiny infant some of whose bones are shown.

females accompanied by infants, the other 6 being males. They lay facing north in crouching positions without pots or relics, barring two with a few ornaments made from marine gastropod shells. A third had four flints of doubtful human workmanship.

Superimposed Burials

Many graves were directly over others, frequently in tiers of two or three, sometimes four. For purposes of identity I will specify the various burials as I have marked the specimens; for example, WM 76 denoting skeleton and relics No. 76 from the Big West Mound; EM 26, burial No. 26 in the Big East Mound, etc. All measurements unless otherwise specified, are in millimeters. To avoid endless repetition of the words "above ground level" and "below ground level," I will refer to the former with a plus and to the latter with a minus sign. Measurements are given to the bottom of the graves whereon the skeletons lay.

One of my early excavations was a long trench east to west through the center of the Big East Mound. Prior to 1898 an excavation had been made there by someone, and I encountered parts of several skeletons at +42″, the foot-bones of one having been left undisturbed in the bank. The old excavation continued down to the Ash Layer but not through it, the hard tough layer evidently having proved too much for the diggers. Passing through this into gravel at −12″, I noticed a slight discoloration at one point and dug there, finding EM 42 a male adult at −30″. The skull like all others lying deep upon the left side, was crushed laterally and twisted diagonally to the face, requiring considerable mending and some restoration. The bone texture of these gravel burials is hard and finely preserved, the color ranging from cream to very light brown. EM 42 being a good male specimen and my first meso in a semi-concealed grave below ground level, I have made it a type, representative of the group. There seemed to be small chance of finding another under it as I dug deeper, for there was no sign of dirt, nevertheless at −50″ under the foot of EM 42 there appeared a skull EM 26; and as it was a crouching long-head, I have made it a type of the deep long-head group. I secured the head and one clavicle and then undercut where the balance

of the skeleton lay fast in the bank. Our enforced method of excavating and then filling in each day's work made operations hazardous at considerable depths, as shown on this occasion. The wall of dirt over 11 feet high, counting the earth around the rim, contained part of the old excavation on one side and could not support itself. Slowly it toppled inward and I was fortunate enough to see and jump clear just in time. This was but the first of other similar experiences in some of which I did not escape so easily. Fortunately I had a dependable assistant to dig me out, illustrating how advisable it is to refrain from excavating Indian mounds alone. Close to the head of EM 26 were four rough flints that I should ordinarily not consider as made and used by human hands. However, they are "worked," and as the gravel has yielded no flint elsewhere, the four pieces at least deserve mention.

In the Big West Mound, a Round-head WM 70 with pot at +24″ lay diagonally over an adult WM 73 at +12″, the latter wearing a copper plate disc over each ear. WM 73 in turn was partially above WM 76 a female Long-head at −30″. The Ash Layer and its two enclosing seams were intact over the last-named skeleton. Its head, left side down, rested upon a mosaic of limestone pebbles, apparently chosen to a 1 inch size. In the center was embedded a small stone block veneered with some green stone, plate X, c. No doubt the block was chosen for its symmetry and oddity. It bore no marks of fabrication. Another interesting feature of this burial was the presence of two long-canaled, low-spired marine gastropods resembling *Fulgur* or *Tudicula*, resting upon the face of WM 76. They were notched around their slender bases and no doubt were used as ornaments. This burial was accidentally exposed from the side, giving an excellent view of the skeleton in its gravel vault, the Ash Layer and its enclosing seams intact above and the Black Seam still higher, the wall section being nearly 9 feet high. In the upper four feet were traces of old filled-in burrows. One burrow still open had a live young woodchuck curled up in a grass nest at the bottom. It was in the month of November and the animal was so thoroughly asleep that after being removed, he was over an hour awaking and limbering up sufficiently to crawl away. There was the clear trace of another

burrow the like of which I have not observed in either of the two big mounds. It extended diagonally from the Black Seam to the Ash Layer and appeared to have originated at the former as it ended abruptly there, running down to the Ash Layer as a tube of grey sandy earth in brown pebbly soil. Within it was a complete skull and some bones of a mink. An infant skeleton lay close to WM 76 in the same grave. The interstices between stones enclosing the skeletons were tightly packed with finer pebbles and sand in a tenacious mass, and the bones were perfectly preserved, much more so than the skeletons WM 73 and WM 70 above. The WM 76 and EM 26 burials described were near the centers of their respective mounds.

Farther out, even near the rims, I found skeletons superimposed. One excavation half way between center and rim on the south side measured when finished 6 feet wide, 11 feet long, and 9 feet deep. Near the north end at the surface was the child with glass and kaolin beads previously mentioned. It overlay a second fragmentary infant skeleton, which in turn was superimposed upon a third immature skeleton at +24″ in the Black Seam, with a small loop-handled pot containing a clam-shell spoon. A fourth child's skeleton lay near the third. Under the feet of the latter at +15″ and above the Ash Layer were two lone adult skulls without lower jaws, both brachycephals—one a male, EM 37; the other a female, EM 38. EM 37 had a small triangular chert arrowpoint lodged in the left temple. This skull directly overlay an infant skeleton, EM 40 at −12″ beneath a 5″ bed of ash dirt, with a small clay pot near the head. Beside EM 40 was a narrow-faced female roundhead EM 39, plate X, b, a prone burial with face looking to the east. A peculiar stub-handled clay pot containing a clam-shell spoon lay near the skull. I removed the skeleton, all of whose bones were in place and continued down into apparently undisturbed limestone gravel. It seemed a waste of effort to go deeper but I did; and at −36″ directly below EM 39, came upon a longhead EM 41, a crouching burial lying east and west accompanied by an infant's skeleton. Such unexpected finds as EM 26 and EM 41 led me to dig deeply in succeeding excavations and with considerable success.

In another excavation near the rim on the west side of the mound an adult meso EM 78 at +18″ was superimposed upon a child EM 79 with grit-tempered pot buried at +6″. The latter overlay an adolescent broad-head EM 80 at −12″ with small triangular chert arrowpoint under the head. At −36″ was an adult broad-head with a fine pot disturbing an adult long-head EM 81, the latter more than 42″ below ground level. Directly south of this excavation and near the rim, an adult and adolescent, EM 95 and EM 94 both round-heads, were side by side −30″ deep. An adult round-head EM 96 was near by 6 inches deeper, almost directly overlying EM 98 an adult long-head in a concealed grave at −48″.

In the Big West Mound, an excavation on the south side near the rim yielded an adult WM 41 at +18″ directly over a second EM 38 +6″ which in turn directly overlay a third WM 39 on ground level. WM 38 is a round-head adult male, the bones showing powerful musculature. Under WM 39 at −30″ was a round-head WM 40 half upon its side, the grave being filled in with grey dirt. Of 8 skeletons found in this hole, one WM 42 at −24″ was a long-head in a concealed grave with no burials directly above it.

These were cases of graves directly overlying each other. Frequently although direct overlying did not occur, a chronological succession was apparent. On the northwest border of the Big East Mound, an adolescent EM 76 lay prone in grey dirt near the surface nearly 3 feet above ground level. The hole measured 10×7 feet. EM 76 was at the center, head south, feet north. A mantle of stones covered head and shoulders. At +24″ close to the east wall, +15″ near the west and extending unbroken through the excavation was an irregular sheet of compact black earth with occasional patches of pebbles. Beneath this near the east wall were two prone brachycephals, EM 69 and EM 70, at +12″, both with clay pots near the heads. They lay in hard brown soil coarsened with fine gravel. In the northwest corner was an ash-bed 5″ thick, its surface at −6″, continuing unbroken through the rest of the hole as a grey dirt and gravel layer so compact as to resemble soft concrete. Beneath the ash-bed and on gravel at −18″ was a prime female adult broad-head EM 72 with a fine, large "antler-

point" pot. In the southwest corner at −18″ was a child EM 70 with a fine, small "antler-point" pot. A slight discoloration in the southeast corner led me to dig there and discover two adults EM 74 and EM 75 in sprawling attitudes without pots or artifacts. The two skulls were much crushed and difficult to measure correctly, but EM 74 appears to be a meso, and EM 75 a round-head.

Occasionally one burial disturbed its predecessor. EM 117, an adult at ground level, had considerably disarranged a round-head EM 116, 3 feet beneath, and a second, EM 115, slightly. These last two lay upon their sides close to and facing each other, their heads pillowed upon clustered artifacts of stone, chert, bone and antler, the largest collection found in any grave of either mound.

Mortuary Customs

In the Upper level, disturbed conditions made it impossible to determine notable characteristics. Artifacts were few and the skeletons lay in various positions mostly irregular. In the Lower Level, all mesos lay in irregular postures, although always upon their sides, the long-heads also upon their sides but studiously arranged with knees drawn far up and arms bent with hands beneath the chin. Mesos and long-heads both had their backs to the south, heads west. The arrangement of pebbles beneath the head of WM 76 has been described. Its appearance was striking, as I was fortunate enough to get a glimpse of it before any of the stones were disturbed. It was a mosaic of 1″ limestone pebbles with an odd stone block in the center, all made level for about 9 inches in diameter. The left side of the skull lay on the center of this mosaic. EM 98 previously discovered had, I believe, a similar arrangement but the skull was difficult to see and reach and I did not suspect that the pebbles all of one size had been placed there for a purpose. The broad-heads lying beneath the Ash Layer of the Middle Level lay flat upon their backs with arms flexed and legs straight or bent sideways. The majority had their heads west, feet east. Each grave was dug no more than large enough to contain the body, and filled in with grey pebbly earth up to the base of the Ash Layer. Every broad-head had a pot or artifacts, and so did some of the round-heads though many of these were without

relics of any kind. Clay pots were placed above or beside the heads, the latter occasionally resting upon small caches of artifacts. No skeleton in either mound had artifacts any lower down than the breast-bone. Pots accompanied female adults and children, the latter generally having small pots and adults medium to large. In eleven cases bones of one hand were within the pots, all being burials of children.

With few exceptions, pots contained clam-shell spoons encrusted with a tenacious and gritty brown film. Bits of bones were in many of the pots which seem to have contained broth or stew. Undisturbed burials had all of the bones in place. None had come in contact with fire or suffered mutilation. No foreign earth appeared. Occasional blotches or red pigment appeared upon the skulls, staining the gravel beneath them. Several stone celts in contact with yellow pigment are etched as though with acid.

Between the Ash Layer and Black Seam, some of the adult skeletons had dense, shiny patches over their heads, apparently black earth mixed with decomposed animal matter. While some of the bones in the Ash Layer were burned, others were not, nor did the adjacent seams or even the hard dirt patches in the Ash Layer itself show trace of burning. There were no signs of altars, except possibly in one instance where a hole had been dug in gravel about three feet round and one foot deep and filled in with ashes. In the latter were a human radius and ulna unburned. The gravel around this cavity was reddened by fire. This was at the western rim of the Big West Mound. I could not find a single burial originating beneath the Black Seam that was not in a hole dug for the purpose. Above that were some skeletons that appeared to have been simply laid down and covered over with stones and dirt, although I am not certain of this. I am certain, however, that there were no bundled burials or cremations.

Burials of the Middle Level

Male adults were scarce, and the first one found I have taken as a type. This individual EM 19 lay in gravel at $-18''$, head west, feet east. The head of the right humerus was much eaten away by injury or disease, and that bone was shorter than the left. On the right side beneath the chin were 14 much decomposed antler points,

probably the remains of a necklace, for they were too curved to have been used as projectiles. Near the right ear was a leaf-shaped chert blade; close to the right shoulder, 6 small triangular chert points and one long slender point. About 6 inches farther down was a polished stone "celt." The 8 chert pieces were placed points upward. After light brushing they and the celt showed long dark discolorations in the gravel, which I interpreted as the remains of wooden shafts to which the pieces were lashed. I merely infer this, for not a particle of wood remained. The lengths of the arrow shafts were about 21″, the celt 15″ and less than 1″ diameter. The leaf-shaped blade showed a half-inch or more diameter, but I could not trace it under the skeleton. Apparently the stone relics represented 7 arrows, a lance and a tomahawk. The skull of EM 19 has a cephalic index of 86.7. The forehead sloped rather strongly, the back of the head is flattened and the sides bulge outward. In no other burial were there any signs of wood in connection with artifacts.

EM 2, a young female adult, another broad-head in gravel, had an otter skull and jaws resting upon the forehead. The rear part of the otter skull was cut or broken off. Below the chin was a large shell bead; at the ears two thin copper discs which had stained each temporal bone green. This was a prone burial—head north, feet south. Near the top of the head was a pot made of clay mixed with pulverized shell. This pot was beside the head of the skeleton. It is $7\frac{3}{4}$″ diameter and $6\frac{1}{4}$″ high, globular, low-rimmed and with constricted neck. The decoration is of a kind that I define as "antler-point."

EM 21, a prone adolescent round-head with projecting face, had a small grit-tempered pot near the left shoulder, a pierced clam-shell pendant upon the breast-bone and some tiny copper plate beads below that. In the double burial EM 115-116 with 117 encroaching, bone and stone artifacts were pillowed under the skulls, and among the implements were bones of animals bearing no marks of fabrication. Many skeletons were unaccompanied by relics of any sort.

In previously disturbed areas with no ash layers above them were several mesos and long-heads. These were crouching burials

above gravel. In direct contact with each, the earth was absolutely free from pebbles, blue black and shiny as though containing clay. The skulls were badly distorted. Three in the body of the mound, EM 83, 101, and 102 seem to be mesos, although measurements are uncertain because of the warped condition of the skulls. EM 83, a young female adult with new-born infant, had a small triangular chert arrowpoint under the left clavicle and a bored round bone point between the left radius and ulna. Close to the head was a crude celt-like stone tablet with 10 bone cylinders adhering to it, cemented there by a tenacious gritty substance. EM 101, a female adult with knobbed grit-tempered pot, appears not to have been quite dead when buried. One arm had crushed the pot, and the hands extending downward were clenched around hard lumps of pebbly earth. The heel-bones had moved forward making grooves in the coarse soil which showed two small piles when I swept the skeleton clean. EM 100, a young female adult, lay in a crouching position, with an infant beside her. This is a long-faced, narrow-nosed long-head. The soil above was disturbed by a previous excavation, and the grave could not be traced upward.

EM 125, plate X, c, a young female adult round-head prone in gravel at $-18''$ at the southern rim of the Big East Mound, had an infant at her left elbow. WM 66, a like case in the Big West Mound, had two infants, plate XI, c. WM 49, a male adult round-head at $-12''$, was accompanied by 3 small triangular chert arrowpoints and a small but interesting collection of bone artifacts, all beneath the head.

WM 45, a half-grown round-head child, was in a funnel-shaped cavity extending down to two feet below ground level and filled in with black dirt free of pebbles or sand. The skeleton lay in this dirt at $-12''$. The head had become detached and was $18''$ higher up encased in a complete deer antler, whose four points had been cut off and the stumps split away for several inches down, making a tool of some sort which showed considerable use.

Artifacts from the Two Big Mounds

Although prolific in pots, the collection does not contain a particularly large number of ornaments and implements although

there are enough and sufficiently varied to make comparisons with similar relics from other localities. Articles used for adornment appear very crude in contrast to those employed for obtaining and preparing food. Art in any form appears solely upon the pots. The latter make a fine collection which will be difficult to duplicate in this region, where whole specimens are practically unknown.

Before discussing the various relics in detail, negative evidence may be considered, for many things that I expected to find, and searched for diligently, were conspicuously absent. There was no sign of grain nor any tools which suggested cultivation of the soil. No seeds or fruit-pits appeared, nor were there any traces of perishable material, such as cloth, hide, hair, woven reeds or wood with a few exceptions. Apparently the people, of the Lower and Middle Levels at least, subsisted upon fish, flesh and fowl. Of cloth, the only suggestion is a small piece about 1 inch square which appears to be coarse matting. It adhered to one of two copper ear discs on the face of WM 73. These discs heavily encrusted with green oxide, had also preserved two round flat and pierced buttons made of leather or wood, discs, and buttons evidently having been fastened together and used as ornaments. In two other instances the buttons had been preserved by contact with the copper discs. Of three copper bead necklaces, the string holding them together was recognizable although reduced to powder. Of wood, I found several small chunks in the Upper Level. These were too soft to handle. Small crumbly pieces of bark lay embedded in the Ash Layer. Near the skull of EM 26, its top below ground level, was a stub 5 inches in diameter and 30 inches long standing on end. This stub was not soft, rather hard and brittle like a walnut shell. Marks of hardened grease appear in some of the clay pots, and the shell spoons are frequently encrusted with a hard, gritty brown film. Some of the bone artifacts have particles of gritty film adhering to them, tenacious enough in several instances to fasten various articles to each other. The dog is the only animal observed that can be considered domesticated. It occurs in the Upper Level but not with certainty below, and I find no sign of it beneath the Ash Layer. The bison is absent. Of chipped stone implements, no notched or stemmed piece occurs

below the Black Seam. The polished stone implements are celts only. Grooved axes and clubs, pierced tablets, effigies and other polished pieces which are occasionally picked up in neighboring localities, remain as yet undiscovered upon the Fisher site. Pipes, too, are absent, at least I have found none, either of stone or clay, in any of the mounds. The objects to be enumerated are clay pots, and artifacts of copper, shell, stone and bone. All measurements are in millimeters.

Clay Pots

Of the pots secured from the two big mounds, only about 6 can be assigned to the Upper Level and as these lay in previously excavated areas, their true position may possibly be at the top of the Middle Level. The remainder were from the Middle Level, some of them so long crushed that fragments had disintegrated. A few were undamaged, others broken but readily mended and restored. In form they are globular with sharply constructed necks and low rims, the latter occasionally almost vertical but generally flaring outward. In size they average 190 mm. in transverse diameter and 140 mm. high, the breadth exceeding the height. Many are shell-tempered; in others the clay was mixed with crushed crystalline rock or chert. The few pots from above are small, the largest one measuring 127 mm. in diameter and 82 mm. high, being with skeleton EM 101 beneath the Black Seam, plate XII, a. The outer surface is smooth except for knobs around the shoulder made by pressing the moist clay from the inside with the finger. There are six of these knobbed pots, plate XII, b. Between the Black Seam and Ash Layer the number of specimens increase and they are finer than those above, the technique improving downward into gravel where the larger and finer pots were found. Most of these are shell-tempered, others rock-tempered. This pottery is as a rule fragile, from 3 to 5 mm thick at the bottom and 1.5 to 3 mm at the shoulder. Most of it is sun-dried or only slightly burned, although a few pieces are hard and brick-like. Outwardly the color is grey or light-brown. The inside surface is frequently pink, possibly occasioned by food within that contains grease, plate XII, c. Small pieces of bone were in many of the pots.

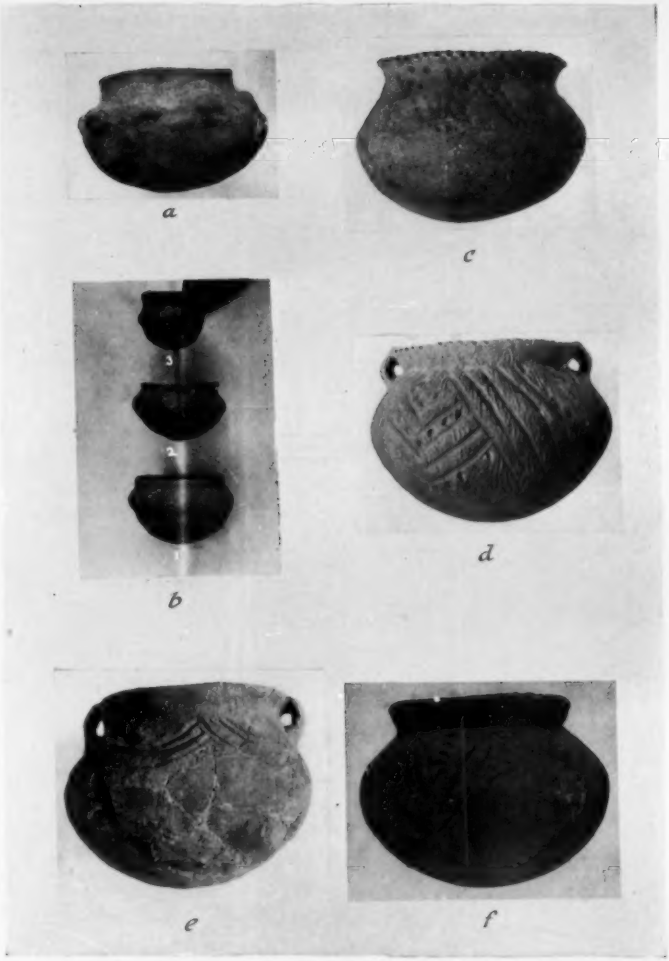

PLATE XII

a. EM 101. Adult meso burial in Zone I of Middle Level. The largest of the "knobbed" clay pots. 1/4. b. Small "knobbed" pots; 1, WM 62, 2, EM 92, 3, EM 112. 3/16. c. EM 12. Big East Mound. Same level as "antler point" pots. A pinkish mineralized grease-line extended about half way from bottom around the inside. 1/4. d. EM 3. A fine typical "antler-point" pot from Middle Level slightly in gravel; shell-tempered. Zone II. 1/4. e. 3EM 14. "Antler-point" pot. Zone II, Middle Level. 1/4. f. Fine example of shell-tempered "antler-point" pot from Zone II of the Big East Mound. 1/4.

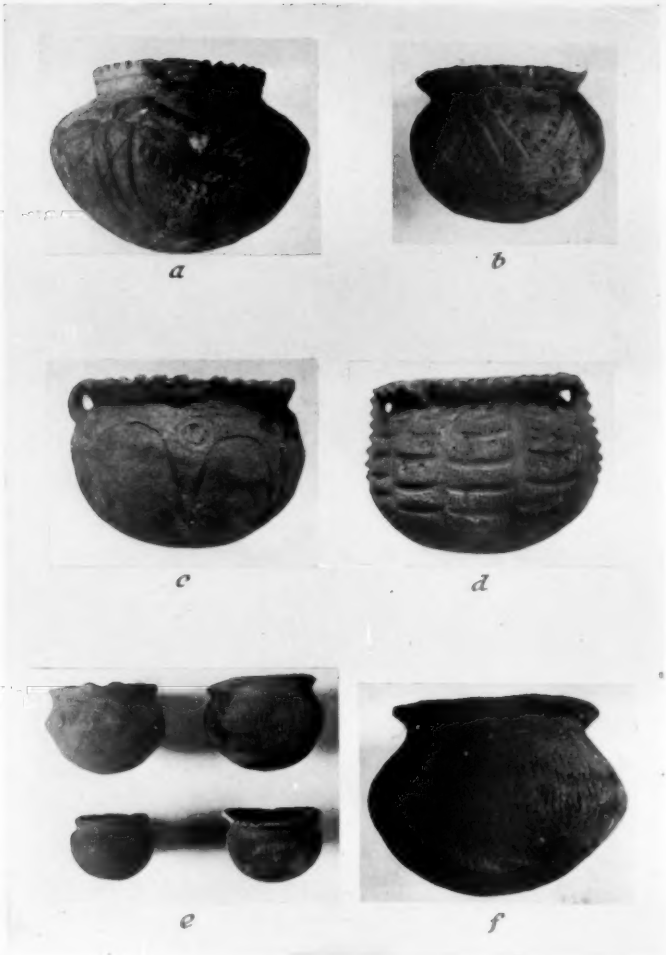

PLATE XIII

a. EM 72. "Antler-point" pot with skeleton female broad-head. Shell-tempered. It has two broad loop handles. All of this type of pot contained carved clam shell spoons. Zone II, Middle Level. 3/16. b. EM 5. Big East Mound. "Antler-point" pot below average size. Shell-tempered. +1/4. c. WM 53. Shell-tempered "antler-point" pot from Big West Mound with prone female adult. Zone II of Middle Level. 1/4. d. WM 58. With prone female adult round-head. One handle is broken off. Otherwise this pot is undamaged. 1/4. e. Big East Mound. The two shell-tempered pots at left from Zone I, Middle Level. The two grit-tempered ones at right are from the Middle Level above gravel, Zone II. The left upper corner figure is one of the "knobbed" pots. It and the one below bear crudely incised decoration. 3/16. f. EM 15. Big East Mound. Grit-tempered, above gravel. 1/4.

The largest and finest specimens accompanied brachycephals buried below ground level. I call them "antler-point" pots because of the ornamentation around the shoulder, plate XII, d, e, f, plate XIII, a, b, c, parallel rows of meanders or festoons interlined with dots, or right and left diagonals in parallel in combination with lines, dashes or dots. These lines about 3 mm wide are impressed with a blunt-pointed instrument, possibly an antler-point, many of which occurred in the two big mounds or near them. Under one skull, EM 115, were a round iron-clay stone, polished and flattened on one side, several antler-points and a spade-like piece of large antler, all of which suggest usage in the making of pottery. A rather common form of decoration was a single meander around the shoulder, impressed with the finger. Potsherds were numerous between the Black Seam and Ash Layer, many of them quite unlike the burial pots, in that they are coarser and thicker and differ in rim shape and decoration. The differences may be merely utilitarian, fragile "antler-point" pieces serving as mortuary vessels and the coarser ware being used more commonly in camp life.

The majority of pots lack handles, but many have two, one opposite the other, plate XIII, d. These are short loops of round or elliptical section. Occasionally lips or lugs appear instead of loop handles. The rim edge is usually indented or crenulated, done with a tool or the fingers. Many of the "antler-point" specimens are rather artistic—round, symmetrical, and attractively decorated. However, as works of art they are entirely aboriginal. The small knobbed pots from near the Black Seam are smooth-surfaced with the exception of two which bear crude incised decoration. None have the roughened surface prevalent in the Middle Level, plate XIII, e, an external finish which may be confused with "cord-modelling" or marks made by patting the clay vessel while moist with a cord-wound stick or paddle. On some of the pots, there seem to be occasional marks of twisted cords; others have a very rough bark-like surface which may have been done by brushing rather than patting. See plate XIII, f. I find no impressions of nets, matting or cloth on any of the specimens. In only three examples do I find any departure from the globular low-rimmed pattern. EM 39 with but one stub-handle resembles a stew pot, plate XIV, a.

It is thick-walled and undecorated. EM 114 although globular-bodied has a high neck without beaded rim, sloping inward, plate XIV b. EM 64 has a rather high neck and is elaborately decorated with diagonals, horizontal lines, and dashes, plate XIV, c. Neither animals nor human beings are portrayed, face or figure, on any of the pots or artifacts. The grit-tempered pots are not so elaborately ornamented. The largest one EM 24 is 245 mm in diameter and 152 mm high. The largest "antler-point" specimen, EM 72 measures 235 mm by 165 mm. In the reconstruction of broken pots, plate XIV, d, I use the same method as with fossil animal bones, cementing the fragments together and filling in gaps with tinted dextrine plaster, plate XIV, e. This process requires patience, but results in a durable restoration no matter how thin or small the fragments may be. One specimen, EM 36 showed an aboriginal repair job. A hole about 8 mm diameter had been accidentally punched through the bottom and the damage remedied by burning on a patch of clay over the hole from the outside.

The potsherds of various neighboring localities seem to be of two kinds which occur together: coarse rock-tempered pieces with low necks and bark-like surfaces; and extremely coarse and thick high-necked pieces with large crystalline tempering medium, brick-red burned and bearing punch-stamped and rouletted decoration, plate XIV, f. Among the thousands of fragments found in and around the mounds, not one resembles this last-named variety so common elsewhere.

Copper

This metal appears sparingly in the Upper Level and is not common in the Middle. See plate XV. Above are a few plates bent into small hollow cones; below a few implements and ornaments, heavily encrusted with green oxide. I found 3 copper celts in the Big East Mound. These were in the east to west trench wherein was the long-head EM 26, and lay between the Black Seam and Ash Layer beneath human bones disturbed by a previous excavation. The longest measures 102 mm, the shortest 83 mm, and the thickness varies from 6 to 10 mm. The adolescent EM 21 in the Middle Level with tiny plate copper beads below the

PLATE XIV

a. EM 39. This odd-shaped, thick, shell-tempered pot lay close to the skull of a narrow-faced, round-head female in Zone II of Middle Level, directly over the deeply buried long-head, EM 41. 1/4. b. EM 114. This high inward sloping neck is unusual. The pot is thick-walled, shell-tempered and ornamented with circular indented lines. 3/16. c. EM 64. This is an unusually high-collared "antler-point" pot, shell-tempered. 1/4. d. EM 71. Some of the pots were badly crushed but I collected all of the pieces and eventually restored the specimens. Middle Level, Zone II. 1/2. e. EM 71. This pot of the Middle Level, Zone II was badly crushed when found and had long been so. I finally got it together as shown.—1/4. f. Stamped and rouletted potsherds. Such coarse, brick-red high collared grit-tempered pieces are not found on the Fisher site. These came from the point of land where the Des Plaines and Kankakee Rivers meet a mile or more below Fisher's and were accompanied by large stemmed and notched flint arrowpoints. 1/2.

PLATE XV

Copper artifacts

The three top copper celts are from the Middle Level of the Big East Mound. The two bead necklaces are from the Middle Level of the Big East Mound. The larger one was with a child WM 14. At right center is a copper nugget with broad-head, EM 31 in the Zone II of the Middle Level.

The two plate cones at right were in the Upper Level or top of Middle Level. At bottom left are two plate ear discs and above them a leather button to which one of the discs was attached.

PLATE XVI
Shell (3/8 size)

The two top and bottom left corner figures are spoons carved from clamshells and found in clay pots. Zone II Middle Level.

The center figure is a thick clam-shell with 1″ round hole in center. Each side of this is a pendant. The one at right was on the sternum of a round-head child EM 21. The small circular piece below is a pendant from the neck of a child WM. All the above are from the Zone II of Middle Level.

At bottom right is one of many clam-shells with rough holes in them—from the diggings in Zone II Middle Level.

breast-bone has been referred to, as have female adults with thin copper discs so close to the ears as to stain the temporal bones green. A two-ounce nugget of virgin copper under the skull of a broad-head, EM 31, would indicate that implements were made upon the site from raw material obtained elsewhere. EM 127, a prone adult brachycephal on gravel, wore a necklace of copper beads, each bead plate rolled to a tube about 12 mm long and 6 mm diameter. WM 14, a round-head child in the Big West Mound, had a similar string in which the size of beads varies greatly. In these two cases, also in a third, the ornament encircled the neck. The Southwest Mound produced four large tube beads.

Shell

The occurence of marine gastropods fabricated into ornaments is interesting. See plate XVI. The long-head WM 76, deep in gravel as has been noted, had two of these shells, notched around their lower extremities. These were touching the face. With EM 98 was a small tube 49 mm long and 6 mm diameter; the column or central part of a marine gastropod. Two other shorter and thicker shell beads were at the throats of broad-heads in the Middle Level. These may have been made from thick river clam shells. They are largest at the center, tapering to both ends. At least four species of clams abundant in the Des Plaines River served as food for the aborigines and some of the shells were fabricated for use. Seventy-five per cent or more of the clay pots contained shell spoons, the hinge portion being trimmed down and the large and double-notched to form a stub handle. Several were scalloped on the lower margin and one had four long prongs which made it appear like a combination spoon and fork. In some of the less deeply buried pots the clam-shells were uncarved and might be considered unutilized except that each reposed within a pot. Many of them bear brown gritty encrustations.

I secured shell pendants from three burials, all placed upon the breast. Two are pierced with tiny holes at one end, and all three have 2 larger holes in the center. Two are of elliptical form, the third is circular. Various problematical fragments accompanied skeletons in the Middle Level.

In the diggings between the Ash Layer and Black Seam were numerous clam-shells, most of them whole, others broken in pieces or with a large rough hole through the center. It may be that the aborigine treated a clam as we do a nut, breaking into it to secure the contents. One very thick shell had a large round hole through it, the upper portion cut away and the lower border much worn. This had evidently been used as a tool of some sort, probably a scraper. Shells of land-snails were common in the diggings, but none show marks of utilization.

Animal Bones

These occurred abundantly in the diggings. See plates XVII and XVIII. Deer bones were the most common, and among these the scapula predominated. Only the articular end was preserved, although the blade could occasionally be recognized by splinters. Foot-bones were plentiful; the upper ends of humeri and femora absent. From the numerous specimens I have thus far identified the deer, elk, bear, canids, wildcat, otter, beaver, mink, weasel, skunk, raccoon, muskrat, rabbit, wild turkey, heron, goose, and soft-shelled turtle, and have recognized small rodents, birds, fishes, and turtles. Frequently unfabricated animal bones served as charms or for other purposes, being found beneath skulls in company with stone and bone artifacts. Often they so occurred in pairs. In the EM 115-EM 116 cache were two tarsal bones representing a wild turkey and heron, two deer astragali or anklebones, two incisor teeth of beaver, a mink's lower jaw, bird bones and several antler-points. Two wildcat humeri accompanied another skeleton. Turtle shells commonly accompanied broad-heads but are much disintegrated. Several of them show red stains, and one at least was pierced. Deer astragali were abundant. Although these are smooth, I have not been able to find one that bears unmistakable stamp of use. Deer and elk phalanges were cut off at the proximal end and hollowed for some purpose. Many such pieces in close association with the skeletons were doubtless used, contrasting with the numerous burned and unburned fragments scattered through the diggings between the Black Seam and ground level.

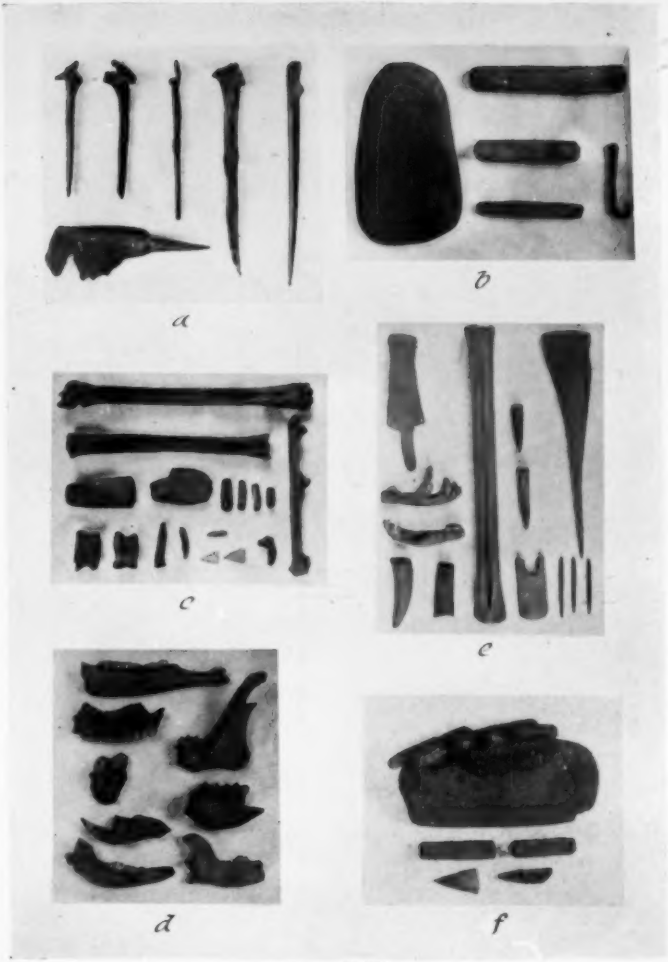

PLATE XVII

a. Bone Pins from under human skulls. The one at right (Raccoon ulna) is from Zone I, also one at bottom. The other four are from Zone II. 1/3. b. WM 49 Male round-head. Stone tablet and 3 bone cylinders, and bone fish-hook. 1/3. c. EM 115–116. Objects under skulls—in part. 2 long deer metacarpal draw-knives, a deer astragalus, 1 stone celt, 1 stone tablet with 4 bone cylinders, 1 antler point, 1 beaver incisor tooth, 3 chert arrowpoints, small mammal jaw and metatarsal bone of wild turkey. 1/8+. d. Animal bones from the diggings. The three upper figures are upper and lower jaw parts of deer. Below them are upper and lower jaw fragments of elk. In lower right hand corner is part jaw (of canid?) showing chopping marks. In left corner is jaw of dog with beaver jaw above it. 1/8+. e. Bone artifacts. The long central object is a deer metacarpal cut off at each end and hollowed throughout its length to two diagonal holes in the lower end. WM 49. At right is a long pin made from a deer scapula. Two bone arrowpoints are between them. In bottom right corner are three pegs notched around one end with a flat tablet to the left of them. In top left corner is a soft-shelled turtle costal plate found beneath the chin of a skull. Below it, two carved bear's jaws. Bored antler point and bored bone in lower left corner. 1/4−. f. EM 83. Stone tablet with 7 antler cylinders adhering (2 broken off). Side view.

PLATE XVIII

Animal bones buried with Human Skeletons. (7/16 size.)

Top center: Lower beaver jaw. Directly under it (center) is one of two deer-astragali with EM 115.

Left top corner: Part of pin made from a deer scapula. A similar piece is to the right of it.

Right top corner: Metatarsal of wild turkey with EM 117. To the left of it is a wild cat humerus, one of a pair.

Center: Mink's lower jaw. Below it at left is an otter's jaw with EM 2 and a raccoon jaw at right.

Left lower corner: Penis bone of raccoon. To the right of it is an antler point notched near end and a small mammal jaw with EM 115 to the right of that.

Bottom center: Fish jaw with two antler points to the right of it.

Bottom right corner: Fish spine with beaver tooth (EM 115) above it.

PLATE XIX (3/8 size.)

The smooth stone tablet and bone cylinders in lower right corner were with a meso EM 83 female adult in Zone I of Middle Level.

The other four pieces shown were under the head of the round-head EM 115.

The flat piece at right, top, is antler; to the left a problematical piece made from an elk scapula. The two left are bone draw knives—all from Zone I or II of the Middle Level.

PLATE XX

Top left corner: Bone (projectile) point with WM 5.

Top center: 3 of 14 antler points at the neck of Broad-head type EM 19.

Top right corner: Part draw knife with EM 116.

Center: Pendant of two carved bear jaws. To the left of this is an elk's toe-bone cut off at one end and hollowed out. To the right are three tubes or beads of shell. Below is an antler tip with EM 116.

Bottom row, left corner: Polished bone (arrow) point bored and dentated at base. Three other similar pieces are in this row. The large central figure has a smaller hole bored in base and is curved with blunt point—probably an ornament.

(All 3/8 natural size.)

Bone Artifacts

Implements of bone occurred from +48″ to −24″, (plates XIX and XX), the deepest being pins made from fish spines and bird metatarsals with so little finish that I could hardly be justified in calling them pins except that all of them were found at the backs of human heads. Higher up in the grey and black dirt were unmistakable pins highly polished and pointed, plate XVII, a. One was made from the ulna bone of a raccoon. Another had been cut from a deer scapula. This is 168 mm long, the top flaring to 38 mm. One female adult wore at her throat a two-piece pendant made from the anterior part of a bear's lower jaws separated at the symphisis. The bone and tooth roots had been cut away, emphasizing the large canines. The type broad-head EM 19 wore a 14-piece antler-point necklace. Antler-points appeared frequently in the diggings, some unfabricated, others bored longitudinally. Of the latter, several were curved with blunt points. Three were straight, sharp-pointed, and highly polished, one of them having a dentate border. Near a female adult round-head WM 5 was a long bone dart-head, which may possibly have made a round hole, present in the top of the skull. Under the skull of WM 49 a male adult round-head was a fine bone fish-hook, the only one found. A slight enlargement of the shank was its sole provision for attachment to a line. I note that although bone artifacts were bored longitudinally, none were pierced with small holes. WM 49 had several other interesting objects. One made from a deer metatarsal, with the two ends cropped closely, is highly polished and hollow throughout its length. In the distal end are two short diagonal holes connecting with the bored shank, plate XVII, e. This implement served me nicely to smoke two cigarettes at once, a use however for which it could hardly have been intended. A dark green polished stone tablet and four antler cylinders completed the list of bone objects with this burial, plate XVII, b. The tablet is celt-shaped, although thin and with well rounded edges. The cylinders are rather flat on one surface, round on the other. The largest is 82.5 mm long and 12.7 mm greatest diameter, the smallest 55.7 mm×7 mm. They adhered to the tablet when I found them. With the double round-head burial EM 115-116 were various bone objects, all beneath

the two skulls. Each had a pair of deer metacarpals hollowed out and concave on one surface so as to resemble double-edged drawknives, plate XVII, c. The scaphoid wrist-bone in three of the four cases was still in place, showing that they had been articulated when the implements were in use. One pair buried in gravel was finely preserved. The other two were rather decomposed, due possibly to the dark-red pigment in which they lay. Another long implement made from an elk scapula was of problematical use, as was a tapering spade-like piece of carved antler 146 mm long, 57 mm wide, and 3.5 mm thick. Tiny bones 43 mm long, tapering at both ends, and 3 mm in diameter were notched at one end and resemble cribbage pegs. There was one flattened piece pointed at each end, and several other larger broken points. Adhering to a rudely shaped flat stone tablet were 6 cylinders of antler flattened on one side and the ends rounded like those found with WM 49. A third example occurred with a young female adult EM 83. The tablet 105 mm long and 48 mm wide is celt-shaped in outline although only 16 mm thick without used edges and unpolished. Six of the antler cylinders adhered to one edge of the tablet, four to one surface, lying close and parallel to one another, large and small ones alternating, plate XVII, f, plate XXI, a. The large cylinders are about 40 mm long and 11 mm wide, the small ones 35 mm by 8 mm. The cementing substance is tenacious and gritty, similar to that encrusting the shell spoons. This stone tablet-bone cylinder combination may have been a popular game like marbles or tiddledewinks, the stone tablet being a "shooter." With WM 34 a female adult was a slender bow-shaped piece 84 mm long and 4.7 mm wide convex on the outer surface, flat on the inner. I have seen similar specimens from elsewhere, defined as weaving implements. The one with WM 34 was under the chin. A short scapula pin lay across the occipital near the lambda. Possibly both pieces were ornaments. These and all other specimens polished and finished so as to be recognizable at a glance as artifacts, originated somewhere above the Ash Layer. Cases WM 49, WM 34 and several others show the originating plane of burial to be below the Black Seam. The cruder, less finished pieces with EM 19 and at least two others, originated below the top Ash Layer seam. This

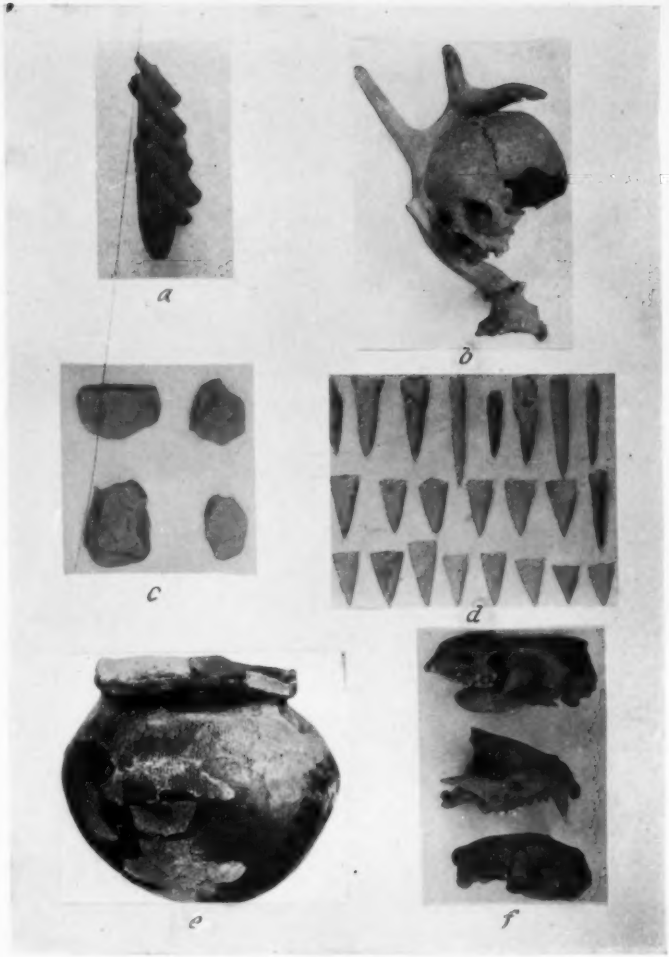

PLATE XXI

a. EM 83. Stone tablet with 7 antler points adhering. Two more became detached. b. WM 45. Skull of child enclosed in fabricated deer antler, just as I found it. The lower jaw and skeleton had dropped a foot farther down. 1/8. c. EM 26. Four problematical "worked" flints under skull of type long-head. 5/16. d. Chert arrow-points from Middle Level of the Two Big Mounds. 3/8+. e. Restored pot from the Gravel Pit. It should have been made lower, more squatty. Note the collared rim. 1/4. f. Top—Otter skull with broad-head, EM 2. Middle—Raccoon skull from WM diggings. Bottom—Mink skull from ancient borrow over the long-head, WM 76. 5/16+.

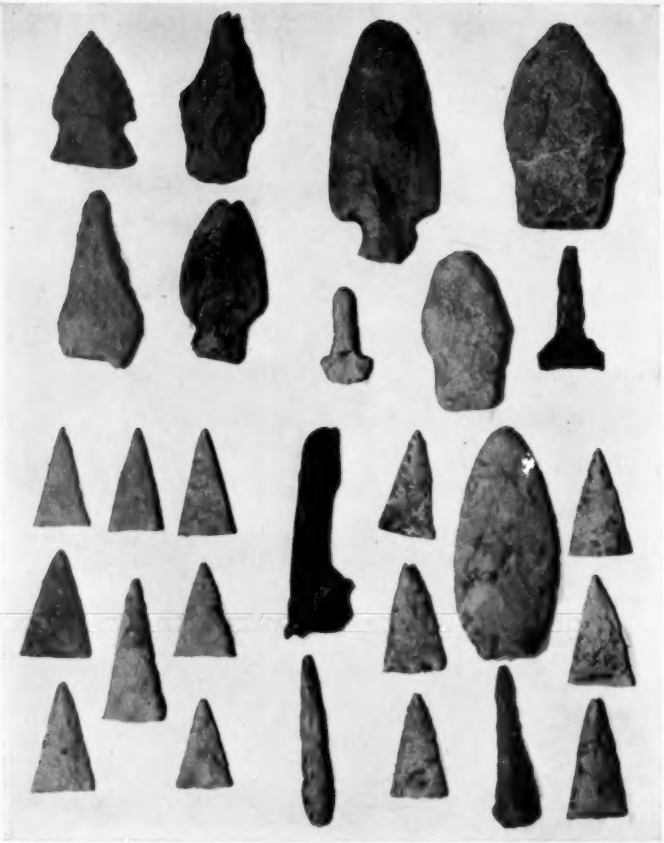

PLATE XXII

The top 9 figures are from the diggings, from 18″ to 6″ above the Black Seam.

The bottom half of picture, the 8 chert arrowpoints at left were in Zone II of the Middle Level with male adult EM 22.

The 8 pieces at right were with the type broad-head EM 19 in Zone II of the Middle Level. In the center is a fourth left human metacarpal with small triangular chert arrowpoint embedded in the base. This came from the Gravel Pit.

suggestion of two bone cultures may be considered unwarranted, and yet it is but one of numerous cases where repeated occurrences of a like nature point to more or less obvious conclusions. In this instance, a crude bone culture appears to underlie a finer one.

Chipped Stone Implements

The problematical flints accompanying the long-head EM 26 are the sole suggestion of a stone culture in the Lower Level, plate XXI, c, plate XXII. Their smooth surfaces and edges denote them to be much older than the fresh flakes and spawls abundant in the diggings above. They appear to have been worked; that is chipped by human hands and yet their shapes do not denote any specific use. It seems more than a coincidence, however, that they should be clustered beneath a human skull in gravel, elsewhere barren of them.

The Middle Level is given up entirely to arrowpoints of triangular and slender forms without notches or stems and the material used is chert, plate XIV, d. These occur solely with brachycephals. In the EM 115-EM 116 bone pillow previously described were 3 small triangular and 1 slender chert point and 6 small hammered chert lumps. The triangular points are from 28.5 to 30.5 mm long, 14 to 16 mm wide, sharp-pointed, keen-edged and thin. The slender points, of circular or elliptical cross-section 30 mm more or less in diameter, are from 25 to 38 mm long. I have found small triangular chert and flint arrowpoints upon the surface in other localities of this region but they are not to be confused with the thin, keen-edged, finely chipped specimens from the Fisher Mounds.

Polished Stone

Implements of hard polished stone consist wholly of "celts" which could have been used very effectively as tomahawks, for they are keen-edged and well-made, plate XXIII. Two above the Ash Layer are chisel-shaped, long and narrow, with the scratches of grinding still on them. One from the diggings in the Black Seam of the Big East Mound is 165 mm long, 38 mm wide at edge and 28.5 mm greatest thickness. The second from about the same level in the Big West Mound is 152 mm long, 33 mm wide at edge and

22 mm greatest thickness. It, too, bears scratches from grinding. This second piece was found driven into the face of a female skull WM 5. Three celts with brachycephals below the Ash Layer are shorter and made of softer grey-green stone. The largest is 98 mm long, 45 mm wide at edge, and 30 mm thick. One with the type broad-head EM 19 has been mentioned as touching a long stain in the gravel, which I interpret as a wooden handle. I found several hammerstones in the diggings, these being quartzite pebbles edged from striking on two opposite sides. One 117 mm long and 64 mm greatest diameter is edged at each end. One piece of sandstone ground flat on one side, convex on the other, has a long groove on the flat side and appears to have been used for smoothing down arrow-shafts.

Smaller Mounds of the Main Group

The four or five smaller mounds around the two big ones have yielded some burials and a few artifacts. Originally inconspicuous, they have now about disappeared after several years of cultivation. Two of them, the West and Southwest mounds can yet be distinguished by those who knew of them; but three years of cultivation have obliterated the remainder. I dug into both of these mounds in 1912, working rather disinterestedly, therefore carelessly even though I found some prone round-heads—female and children—over crouching or irregular mesos and long-heads. Aside from potsherds, charcoal, ashes, clam-shells and splintered animal bones, I secured no relics. Two lower burials in gravel were what I now define as semi-concealed graves. In the fall of 1924 the Southwest mound yielded a fine long-head cranium SW 1 at $-48''$ in a concealed grave that I never would have discovered had I not learned by this time that digging deeply, even though blindly, occasionally produced results. At $-6''$ were four large copper tube beads.

The West mound yielded two mesos, one a large young adult W 1 whose skull I took out at $-36''$, embedded in a gravel matrix. The North mound NM contained several much crushed female round-heads. In neither of these two places were there any relics with the skeletons except clamshells, grit-tempered potsherds and splintered deer-bones, and these occurred very sparingly near the surface.

PLATE XXIII

Polished Stone Celts (3/8 natural size.)

Top row, left: This was jammed into the nose of WM 5. Middle Level, Zone I.
Middle: From the diggings, Zone I, Middle. Right: Turned up by plow slightly to west of Big West Mound.

Bottom row, left: Buried with type broad-head EM 19.
Middle: Buried with EM 116 Middle Level.
Right: Buried with WM 25 Middle Level.

The Lodge Pits

I arbitrarily define the numerous saucer-like depressions as "lodge-pits" because they appear to be the remains of dugouts, possibly once roofed over with bark or skins. These would have made excellent shelters in cold weather. When working in freezing temperatures my assistant and I always found comfort from the biting wind sweeping over us after digging down to a depth of four or five feet. While excavating the two big mounds we occasionally sank trial holes near the rims of pits. One of these holes to the south encountered at −12″ the broken skull and some bones of a dog and at −18″ a much broken grit-tempered pot unlike those secured from the two big mounds. Beneath the pot, amid broken animal bones, clam-shells and potsherds, were a complete human skull and pelvis bone. The skull S 1, a young adult male meso, had a round perforation over one eye which might have been made by a bone arrowpoint nearby.

Near another pit rim west of the first one 18 inches below the surface, were two prone female skeletons close together. WS 2, whose skull is in fine condition for measurement has a round, rather high skull with short face. No relics, potsherds, or splintered animal bones accompanied the skeleton, which appears quite recent, much more so than S 1.

A third hole north of the Big East Mound at another point through charcoal and ashes disclosed no human remains; but 6 feet below the surface, 5 feet in gravel were bones of dog, deer, and turtles with a bushel of clam-shells at the bottom. The two halves of each shell were together, and evidently had not been separated. In the debris was a limestone pipe of "platform" or monitor type with conical bowl resting on a boat-shaped base, the latter scratched with lines possibly intended as symbols. This cache appeared quite recent, the bones and shells being much fresher than in any other excavation and the hole could be traced upward to the dark surface soil.

Four holes in the centers of as many pits yielded nothing. When they were first plowed over and the dirt washed with rain, I picked up many potsherds and splintered animal bones, a few fragments of copper plate and only one bone artifact, the pierced

canine tooth of a bear, which was no doubt comparatively recent as it lay embedded in sod, hardly two inches below the surface.

Gravel Pit Mounds

Of the three Gravel Pit Mounds or burial heaps 100 yards west of the main group, the south one most resembling a mound was destroyed by removal of gravel several years ago. It was 25 feet in diameter and scarcely two feet high. I estimate that some 25 adults were buried in it. The workmen took away several good skulls but I secured some of the broken specimens and numerous limb bones. No long-heads or mesos were in the lot, and no ashes, potsherds, clam-shells nor broken animal bones. Among the human skeletal parts was a fourth left human metacarpal, in whose base was embedded a small triangular chert arrowpoint, which had pierced the palm of the left hand near the wrist and protruded at the back. Apparently the injured person had made an unsuccessful effort to remove the missile, finally permitting it to remain, with the bone enlarging around it. A shattered clay pot lying on the pit slope was buried near the mound but not in it, plate XXI, e.

The gravel pit also encroached upon a burial-heap to the north. Being shapeless in outline and only one foot high this could scarcely be called a mound. From among the bones, broken skulls and jaws tumbled down, I secured two specimens; a cranium, GP 1, and fine skull minus lower jaws, GP 3. The former is a round, high cranium; the latter a meso, high with moderately broad nose, long face and high orbits. No relics or camp refuse accompanied these specimens.

The third and smallest mound of the trio was beyond reach of the gravel-pit. I sank a hole in it and found three adult skeletons huddled together, scarcely a foot below the surface. There were a few grit-tempered potsherds, and clam-shells near them. A marked peculiarity, not observed elsewhere upon this site, was the manner of burial. The three skeletons lay upon their sides, every bone in place, with arms and legs so tightly flexed that they must have been tied into those positions. The distal ends of the ulnae and radii almost touched the humeri below the neck; and each heel

was against the pelvis. Traces of red powder appeared around these skeletons. One skull, an adult round-head, NGP 2, is well preserved.

Notes on the Skeletons

The intention here is to comment on the best preserved and most representative specimens, striving to illustrate as briefly as possible the various types and to determine if possible whether or not the succession of human occupations suggested by the stratigraphy of the mounds and the cultural changes therein is supported by evidence of the skeletons, particularly the skulls. Eliminating young children and adults hopelessly distorted or not yet mended, there are at present 87 available, whose dimensions I tabulate in two groups: one of 42, wherein the correct position of each individual is known; and a second of 45, wherein there is some doubt as to just where the graves originated. The skulls are grouped by levels and zones according to stratigraphic evidence only. The measurements and determinations of age and sex follow the precepts set forth in Hrdlicka's *Anthropometry*. The measurements, all expressed in millimeters, are not to be considered as final, for the limited time I have been able to spend upon them and my lack of special instruments do not permit of absolute accuracy. However, the many crushed and distorted specimens call for correct judgment as much as accuracy in making measurements which are given for the specimens not as they actually are but what they would be undistorted; therefore my figures must suffice for the present to illustrate the various types by approximate sizes and proportions. All dimensions are in straight lines except the nasion-bregma and nasion-opisthion arcs which are taped over the convex surfaces. To the actual length of face, nasion to menton, should be added tooth wear wherever the upper and lower incisors articulate and are reduced by abrasion. Before commenting on the skeletons individually, certain characteristics may be applied to them as a whole. With few exceptions every cranial vault is elevated along the sagittal suture so that viewed posteriorly, the skull outline is roughly pentagonal. The two upper incisor teeth are thick and "shovel-shaped," this feature showing to best advantage in young individuals with teeth unworn,

plate XXIV, a. When badly worn, the upper two incisors are with difficulty distinguished from premolars. Of the limb bones, the femur is flattened diagonally or front-to-back below the neck, and the tibia shaft is flattened laterally, these peculiarities being exaggerated in males and often absent in females. The nose is generally much depressed below the nasion. The nasal bones are long; lower nasal margins sharp in a few specimens, round or obscure in many, and guttered in several. As a rule the forehead slopes strongly without prominence, the exceptions occurring in some of the more recent skulls. All adults have the third molar present in both upper and lower jaws.

Skulls of the Upper Level

While there are numerous fragmentary skeletons above the Black Seam of the Big East Mound, no complete skulls are available. The Big West Mound however has yielded several, possibly more, but there is some uncertainty as to their plane of origin. Most of them lay beneath the Black Seam and some doubtless originated above it but previous excavations and animal burrowings had in many places so churned up the dark soil that determinations by strata were impossible. However, one case, a prime male adult, WM 38, appeared to have originated above the Black Seam directly overlying two other skeletons, WM 39 and WM 40, the latter a round-head which seemed to have long antedated the two above it. No relics accompanied any one of these three skeletons. I have chosen WM 38 as typical of the Upper Level. The skull is complete, undistorted, and very rugged. The limb-bones denote a rather short and powerful individual. The cranium measures 176 mm long, 141 mm wide and 136 mm high, denoting a round, fairly high head, plate XXIV, b,c,d. The nose is large and broad, with lower nasal margins obscure. The nasal bones are extremely narrow, the combined width at one-third their length from the nasion being only 4.7 mm, scarcely half the width of most others. The bizygomatic breadth of 145 mm exceeds the skull width by 4 mm. The length of facial index is short, but as the incisor teeth articulate perfectly and are worn down at least 7 mm the face may be considered as that much longer, making the face

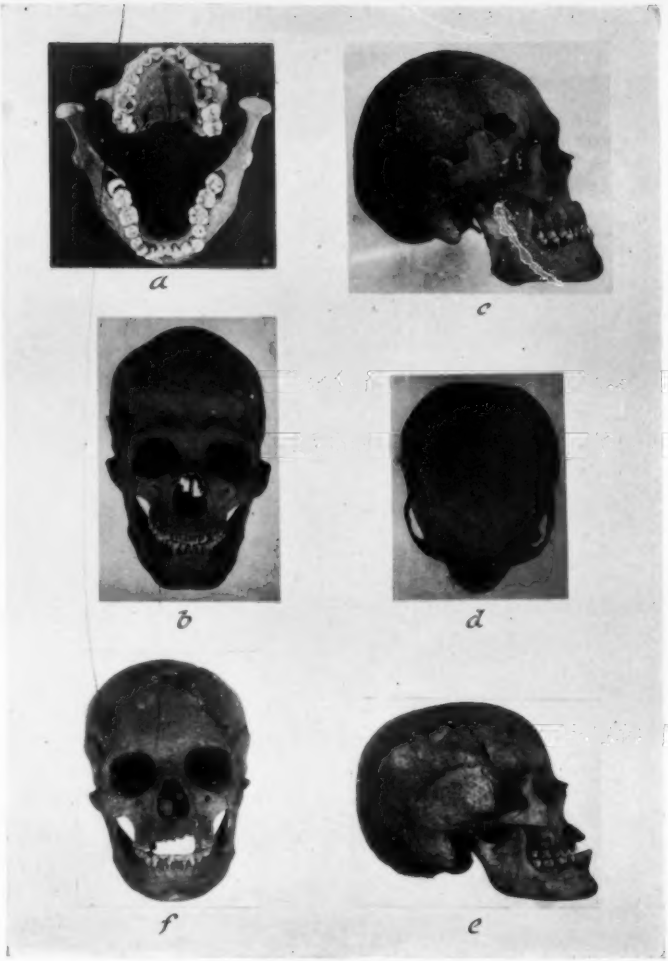

PLATE XXIV

a. EM 2. Young female adult Broad-head. Upper and Lower jaw. b, c and d. WM 38. Male adult Round-head; type of Upper Level. Note the prominent forehead, broad nose and short upper lip. 3/16. e. WS 2. Upper Level. Short-faced female Round-head from near lodge-pit. No artifacts. Prominent forehead and short upper lip. 3/16. f. WS 2. Round-head with unusually short face. 3/16. (See also Plate XXV, a.)

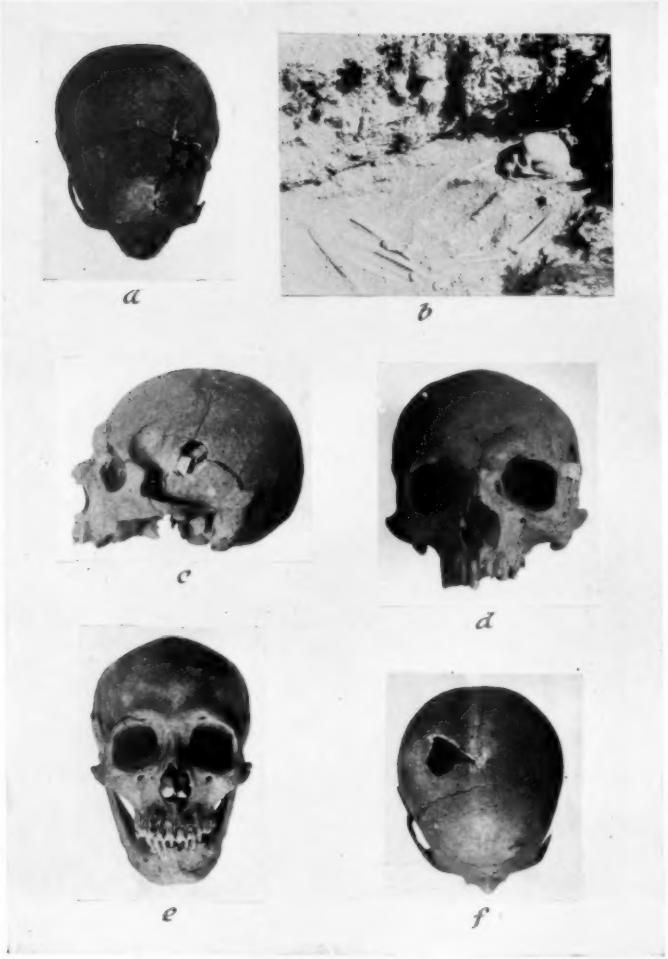

PLATE XXV

a. WS 2. Female, young adult Round-head from Upper Level. 3/16+. (See also Plate XXIV, e and f.) b. EM 126. c. EM 37. Broad-head. Note the small triangular chert arrowpoint in left temple as found. Middle Level, Zone I. 3/16. d. EM 37. 3/16+. e and f. EM 19. Type Broad-head male adult. A typical prone extended burial with bone, chipped chert and polished stone artifacts, among which were small triangular chert arrowpoints. Found on gravel, Middle Level, Zone II. The camera pointing perpendicularly to plane of face makes the face look longer. The width at parietals appears smaller, being beyond the focus. 3/16−.

meso. From base of nasal opening to alveolar point the distance is 15 mm, that is, very short compared with the other skulls. The forehead is prominent; and this combined with the large nose and short upper lip gives WM 38 decided individuality.

WS 2, a young female adult from near one of the lodge pits and close to the surface, is doubtless a comparatively recent burial, plate XXIV, e, f, plate XXV, a. The skull resembles WM 38. It is round-head with prominent forehead, broad nose and short upper lip.

Of doubtfully tabulated specimens, NGP 2, also a comparatively recent burial from the Gravel Pit Mound Group, approaches the type. It is one of three clustered together, the other two being short and powerful individuals. NGP 2 is more slender-limbed,—an old male adult round-head with broad nose, short upper lip and broad face, the bizygomatic breadth of 148 mm exceeding the width of skull by 8 mm.

WM 39 underlay WM 38 closely, and although an earlier burial did not appear to have long antedated it. The skull is that of an old male. The cephalic and height-length indices show it to be a meso and quite high. The bizygomatic breadth is 142 mm, 3 mm greater than width of head. The nose is narrower and the orbits higher and narrower than in WM 38.

Skulls of the Upper Level or Zone I of Middle Level

All of these are cases where the stratigraphic record is more or less uncertain. Perhaps WM 57 is typical. This is a prime adult male lying half upon its side with knees drawn up at 12″ above ground level and without artifacts. The skull is massive and rugged; 178 mm long, 147 mm wide, and 137 mm high, a round rather high specimen with sloping forehead and meso nose inclined to be long, lower nasal margins obscure. The face and orbits are meso. The incisors, like the other teeth, articulate perfectly and are considerably worn. WM 67 an old male has a cephalic index of 79.4. The skull is high, nose rather broad and face wide for the length. This skull overlay a cache of rejects or rough unstemmed chert arrowpoints.

GP 3 from the Gravel Pit is a female adult skull minus lower

jaws which I consider a comparatively recent burial. The cephalic and height-length indices are 78.3 and 82 respectively, denoting a high meso head. The nose and face are meso; the orbits quite narrow with an index of 100.5.

WM 7, a female adult, has meso cephalic, nasal, facial and orbital indices. In the majority of the Fisher skulls, the coronal sutures of the cranium are simple but in this specimen they are complexly convoluted.

WM 32, a female adult, is a meso with high head, broad face, and low orbits. The nose is exceptionally broad, nasal index 67.1 and the features are inclined to prognathism.

EM 126, an adolescent round-head, was a prone burial 18" below ground level, but since it was at the rim of the mound, almost outside of it, I found no strata above the grave to guide me. In the upper part of the mounds, skulls show little or no prognathism, the chins project prominently and the upper and lower incisors articulate. EM 126 has a gnathic index of 113, the chin recedes and the upper incisor teeth overlap the lower ones. The teeth are large, particularly the upper canines, which stand out prominently from the others. See plate XXV, b.

Skulls of the Middle Level. Zone I.

Here are included all burials originating beneath the Black Seam and above the Ash Layer. I also include certain burials that originated in the Black Seam; that is, the thin compact layer had been pierced and the graves filled in, the dark soil above continuing upward undisturbed. EM 83, a young female adult, lay in a studiously arranged crouching posture, with a tiny infant pressed closely to her and some bone and stone artifacts near the head. The skull, much crushed and compressed diagonally, I interpret as a high meso with broad nose and long face. The nasion-opisthion arc length is 378 mm.

EM 100 is a very similar case. It, too, is a young female adult which lay in a set crouching posture with a tiny infant. No relics accompanied this burial. The cephalic index of 71.2 would indicate this to be a long-head, but narrow-head would state the case more correctly, for the skull is only 124 mm wide. The nasal, facial, and

orbital indices also show extreme length or height in proportion to the width. All of the measurements are doubtful, seeing that this skull has been much compressed laterally.

EM 101, another example, was a prone adult accompanied by a knobbed, grit-tempered pot without decoration. The skull is compressed diagonally but I interpret it as a meso; nasion-opisthion arc length 380 mm.

EM 102, also a meso with diagonally compressed skull, has a 374 mm nasion-opisthion arc length. This was a prone male adult without relics. EM 102 and EM 101 were the only graves, originating beneath the Black Seam, that had penetrated the Ash Layer.

WM 25, a prime male adult, appears to be a round-head with a cephalic index of 81.4, this figure being quite doubtful, however, as the skull is diagonally compressed. It is a broad-faced, broad-nosed specimen with low orbits; orbital index 73.8.

WM 26, an accompanying burial, is a female adult meso with broad nose and long face. The skull vault is ridged along the sagittal suture into an exaggerated crest.

EM 37 and 38 are of very different type from those already enumerated. They lacked lower jaws and skeletal parts when found and yet I was unable to discern any disturbance of the earth about them. A small triangular chert arrowpoint was embedded in the left temple of EM 37 and I could see it as the dirt fell away from the skull before I touched it, plate XXV, c, d. This is a rather old male, rugged and heavily ridged for muscle attachments. It is hard, heavy and undistorted. The length measures 173 mm, width 149 mm and height 145 mm. The bizygomatic breadth of 152 mm is 7 mm greater than the width of skull. The cephalic and height-length indices show this to be a broad, high head with meso nose and face and high orbits. EM 38 is a female adult round-head. These two lone skulls were shifted somehow from their original resting places but not by any modern excavations.

Broad and Round Skulls of the Middle Level. Zone II.

These are the prolific relic-bearing burials characterized by numerous clay pots, small triangular chert arrowpoints and objects

made of bone, copper, stone, and shell. I have taken EM 19 as the type, plate XXV, e, f, it being the first of its kind I found, also a male adult amid a horde of children and female adults. The skull, complete and undistorted, measures 173 mm long, 150 mm wide and 138 mm high; cephalic index 86.7, height-length index 80. The forehead is low and the rear of skull flattened around the lambda. The parietals bulge strongly outward, giving the skull exaggerated width, which is accentuated by the narrow frontal, 94 mm at temples. The lower jaw development is feeble at the rear. The angle is more obtuse and the lower line inclines downward more than in any specimens previously described. The vault of cranium is thick, but the specimen seems neither hard nor heavy. The nose is narrow, nasal index 46.7, and the lower margins are rounding. The face is not short, but the great bizygomatic breadth of 147 mm gives a low facial index, 84.3. The orbits are large with rounded corners, orbital index 87.9 denoting meso orbits. The lower cheek border at the junction of malar and upper maxillary is an unbroken line devoid of tubercle, a rare feature in the numerous other skulls of all types. The skull vault is keeled along the sagittal suture. All sutures are open. The teeth are large and considerably worn. Several molars of the lower jaw have been shed. A striking characteristic of this skull is the oblique position of the incisor teeth which are thick and inclined outward so strongly that the upper and lower ones do not effectively oppose each other, those above overlapping the ones below. The protruding teeth, the massive upper and the feeble lower jaw, all give a general effect of prognathism and receding chin. This effect is very noticeable in many of the Middle Level brachycephals from both big mounds. EM 2, 21, 80, 91, 126 and WM 32, 47, 66, 70 and 75 are good examples which contrast strongly with numerous other skulls from all levels, wherein the incisors articulate as perfectly as the other teeth and eventually wear down to the roots.

EM 2, a young female adult with clay pot, shell bead and copper plate ear discs, has the broadest skull found in the mounds. It is 160 mm wide, which with 175 mm length gives a cephalic index of 91.4. The nose is meso, the lower margins obscure. As in EM 19, the forehead slopes and the occipital region is flattened around the

lambda. The lower line of jaw inclines strongly downward to the chin and joins the ramus in a wide curve. EM 2 and EM 19 rested upon their occiputs and show no lateral distortion. EM 19 is light brown, EM 2 darker.

EM 80, an adolescent, probably a girl, is in fine condition. This skull, like its two predecessors, is flattened around the lambda. The lower nasal margins are guttered. The face is prognathic, gnathic index 105. The obtuse-angled jaw, with sloping lower border, and projecting incisors are very pronounced in this specimen. The color is light buff.

EM 69, a young adult which I have listed as a male, may be a female. The sutures are open; teeth worn but in good condition. The nasal index of 48.4 shows medium. The lower nasal borders are obscure. The lower jaws are more strongly developed than those of other broad-heads.

EM 71, a female adult, is much like EM 2. The cephalic index is 90.9. The nose is narrow, the lower margins obscure.

EM 72, also a female adult, has a cephalic index of 85.2. See plate XXVI, a, b. The lower nasal margins are sharp. The type EM 19 is almost without concavity of upper maxillary below the infra-orbital foramen. In EM 72 we find the other extreme, this region being very deeply concave.

WM 53, a prone female adult with elaborately ornamented "antler-point" pot, is the only Middle Level broad-head I have found in the Big West Mound. The cephalic index is 90.5. The nose is rather broad, the face long.

EM 91, a female adult, typifies a number of skulls whose only notable difference from the broad-heads lies in the lesser breadth, and indices ranging from 80 to less than 85 instead of over 85. These are prone burials with pots or artifacts lying beneath the Ash Layer. EM 91 skull measures 176 mm long, 143 mm wide and 141 mm high. The cephalic index is 81.2, the height-length index 80.1. The nasal opening is narrow with lower margins obscure. The upper maxillary like that of EM 19 is without concavity below the infra-orbital foramen. The sloping lower margin and obtuse angle of the lower jaw is in common with the broad-heads, a notable feature.

EM 94, a rather young female adult skull, 175 mm long and 140 mm wide, has a cephalic index of 80. The nose is meso, lower nasal margins obscure. The teeth are rather worn, otherwise in good condition. The face is long, facial index 96.4. The color of this specimen is light brown.

EM 96, a male adult skull with a cephalic index of 84.3, has complex convolutions in the coronal sutures. The nose is broad, the lower margins strongly guttered. The color of the specimen is buff.

Round Skulls of the Middle Level. Zone III

The members of this group are all small female adults. Judging from their limb bones, none of them were over 4 feet 10 inches tall. They were buried without relics in graves so small that the bodies had to be folded up and crammed in. These were burials in gravel, deeper than those of Zone II and their only distinction from Lower Level graves was that brown pebbly earth was used to fill in the graves making them very easy to find after digging down a foot below ground level to gravel.

WM 22 skull is hard and very heavy and appears more ancient than any other specimen in the mounds. (See plate XXVI, c, d and e.) Surrounding soil conditions, however, had more to do with the preservation of the various skulls than anything else. Of those embedded in gravel untouched by soil, the bone color and texture is much better preserved than others less ancient in contact with dirt. WM 22 was covered with about 12 inches of torpedo sand or very fine gravel with brown pebbly soil over that. The skull is only slightly crushed, with little distortion. All of the molar teeth have been shed, those remaining being much worn. The length of cranium is 170 mm, width 137 mm, height 133 mm; cephalic index 80.3, height-length index 78.4. The nose is narrow, nasal index 43.6, lower margins sharp. The orbits are low, rectangular, and horizontal. The left lower maxillary is diseased and sunken deeply below the infra-orbital foramen.

EM 30, the smallest adult skull in the collection, also represents the most aged individual. It measures only 164 mm long, 133 mm wide and 133 mm high. The cranial sutures are closed, the jaws almost toothless.

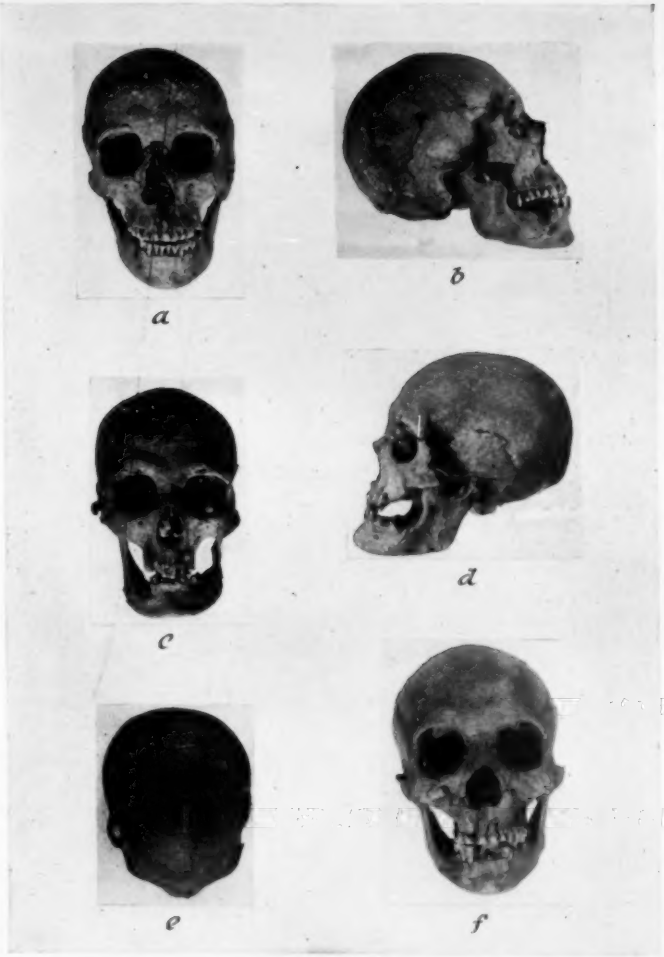

PLATE XXVI

a 3 EM 72 Broad-head female adult prone extended burial slightly in gravel with "antler-point" pot. Cephalic index about 85. This is from the same level as EM 19 and EM 2 where the great bulk of the relics were found. Zone II. 3/16+. b. EM 72. Female adult Broad-head, cephlic index, 85. With large pot slightly in gravel. Zone II. 3/16. c. WM 22. Round-head male adult. In gravel without artifacts. No particular position of skeleton. This skull is hard and heavy. Middle Level, Zone, II. 3/16. d. WM 22. Round-head male adult deep in gravel without artifacts. Middle Level, Zone III. 3/16−. e. WM 22 Round-head male adult. Middle Level, Zone III. 3/16+. f. EM 65. Male adult pygmy in gravel at base of Middle Level, Zone III. This is a Round-head without artifacts. Some of these Round-heads were deeper than Meso-heads like EM 44 but the graves can be traced higher but not as high as the Broad-heads EM 2-197-2. 3/16+. (See also Plate XXVII, a. c and d.)

PLATE XXVII

a. EM 65. Female Round-head from Zone III, Middle Level. Irregular burial without artifacts. 3/16. b. S 1. Meso-head from near lodge-pit. 3/16+. c. EM 65 Rear View. 3/16. d. EM 65. Female adult Round-head from Zone III of Middle Level. Note the small bone at the bregma. 3/16−. e. S 1. Young male adult Meso from near lodge-pit. I strongly believe that a bone arrowpoint nearby made the hole over the right eye. Note the small, narrow nose with sharp lower margin. 3/16+. f. 3 EM 42. Type Meso-head male adult. Irregular burial in gravel above Long-head EM 26. Zone I. 3/16−. (See also Plate XXVIII, a and b.)

EM 65, a much younger adult, has a fine undistorted skull 170 mm long, 141 mm broad and 135 mm high. (See plate XXVI, f; plate XXVII, a, c and d.) This is a round, rather high head with narrow nose, meso face and large high orbits oblique and with round corners. A small separate bone lies in the sagittal suture near the bregma. Close to EM 65 was another individual of about the same size, EM 66. The skull was crushed and distorted beyond repair.

Skulls from the Middle Level. General.

Here are included all skulls that because of disturbed conditions or of their positions near the rims of the mounds, cannot be located with certainty by overlying strata. EM 82, a female adult round-head with cephalic index of 84.8, may belong to Zone III closely overlying a Lower Level burial. The skull is quite high, nose rather narrow, face long, orbits low. EM 28, a female adult, has a fine high round skull with narrow nose, long face and high orbits. Possibly this specimen belonged in Zone II. EM 43, an old female adult, was a crouching burial lying on the left side in gravel with disturbed conditions above. It has a long, high skull with meso nose, long face and low orbits. The feeble lower jaw development likens this specimen to the broad and round heads of Zone II. EM 46, also a female adult, with a cephalic index of 71.8, is very like EM 43. EM 109 a prime male adult from the rim of the Big East Mound, has a skull length of 181 mm, width 150 mm, cephalic index 82.8. This is a rugged specimen with all sutures open, color buff. The teeth are much worn, some shed, others decayed. An interesting feature of this specimen is the occipital bone which is divided by horizontal suture into two parts. The lower part has a deep circular depression, about 27 mm in diameter, placed centrally below and touching the dividing suture. The bone is not over 1 mm thick in the center of the depression. The nose is meso, the lower nasal borders obscure. The greatest width of lower jaws across the condyles is 140 mm which is equaled only by one other specimen EM 48, yet to be described.

From the Big West Mound are WM 49 male adult and WM 66 and WM 70 females, all round-heads. The two latter, both prone

burials have broad faces, broad noses and low orbits. They appeared to belong to Zone II, and WM 49 to Zone I. WM 5, a dilapidated female adult, is a very doubtful meso probably belonging in Zone I. The blade of a fine chisel-like stone celt was 1 inch in the nasal opening. This celt shows very plainly the scratches made when it was ground to shape. Skull S 1 from the border of a lodge-pit about 100 feet south of the Big West Mound is complete undistorted specimen of male adult 184 mm long, 142 mm wide, (See plate XXVII, b and e.) 138 mm high; cephalic and height-length indices 77 and 75.2 denoting a meso rather low head. The nose is small and narrow with all borders sharp, face long, orbits low.

Mesos of the Lower Level

EM 42, taken as the type, is a powerful young male adult. Like many others of its kind, the skull is not only crushed but twisted by diagonal compression so that measurements of the cranium are uncertain. The skull is very massive, the face equally so. (See plate XXVII, f; plate XXVIII, a and b.) The coronal and sagittal sutures are partly closed. Except that it is defined as a meso, the various indices show no marked distinctions from the long-heads to be described. This cranium measures doubtfully, restored, 182.5 mm long, 140 mm broad, 147 mm high. The teeth although much worn by abrasion upon each other, are all present and free from decay. The color of this specimen is buff and light brown.

EM 89 is a younger male adult, a massive specimen less distorted than EM 42. (See plate XXVIII, c, d, and e.) The color is buff, texture rather brittle like other Lower Level burials. Except for a decayed upper right canine, the teeth although worn are all present and in good condition. The nose is decidedly small and narrow for the massive features.

EM 48, an old male, is a very rugged skull, the largest I have found anywhere upon the Fisher site. In color it ranges from buff to brown. It is badly crushed laterally with some distortion. The restored cranial measurements are: length 190 mm, width 149 mm, height 148 mm. The nasion-opisthion arc length is 392 mm. The nose is small and narrow.

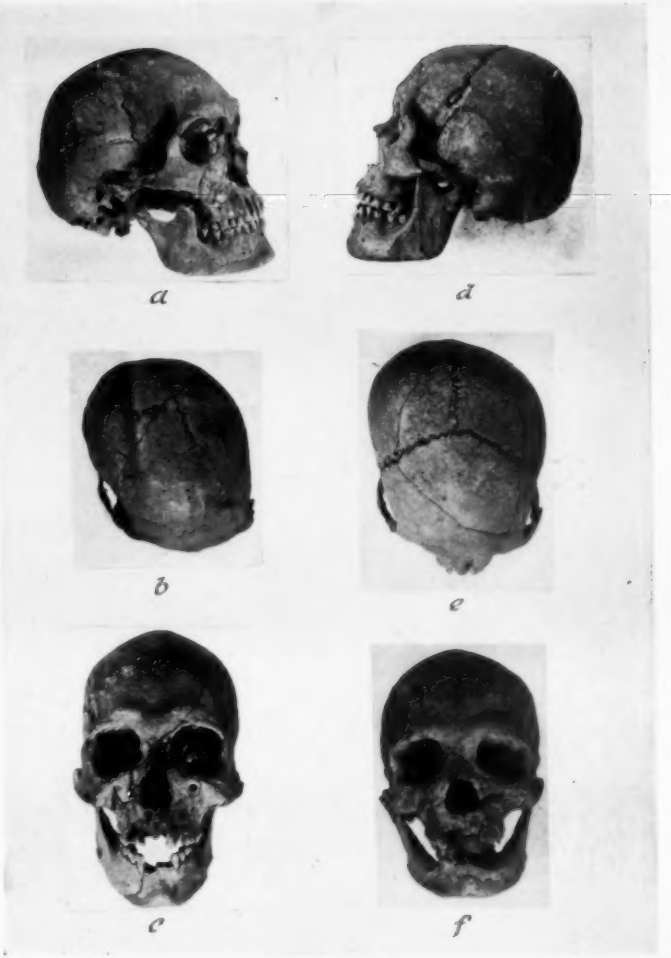

PLATE XXVIII

a. EM 42. Type Meso-head, male adult. Lower Level, Zone I. Large twisted skull. This is typical of a group of skeletons, the largest in the Big East Mound, all lying upon their sides, without pots or artifacts. 3/16+. b. EM 42. Type Meso-head, male adult. Irregular burial. This is one of the large twisted skulls found buried deeply in gravel. Zone I, Lower Level. 3/16−. c. EM 89. Male adult Meso, Lower Level, Zone I. 3/16. d. EM 89. Male adult Meso. Lower Level, Zone I. 3/16. e. Male adult Meso. Lower Level, Zone I. 3/16. f. EM 26. Type Long-head, Zone II of Lower Level with problematical flints. 3/16. (See also Plate XXIX, a, b and c.)

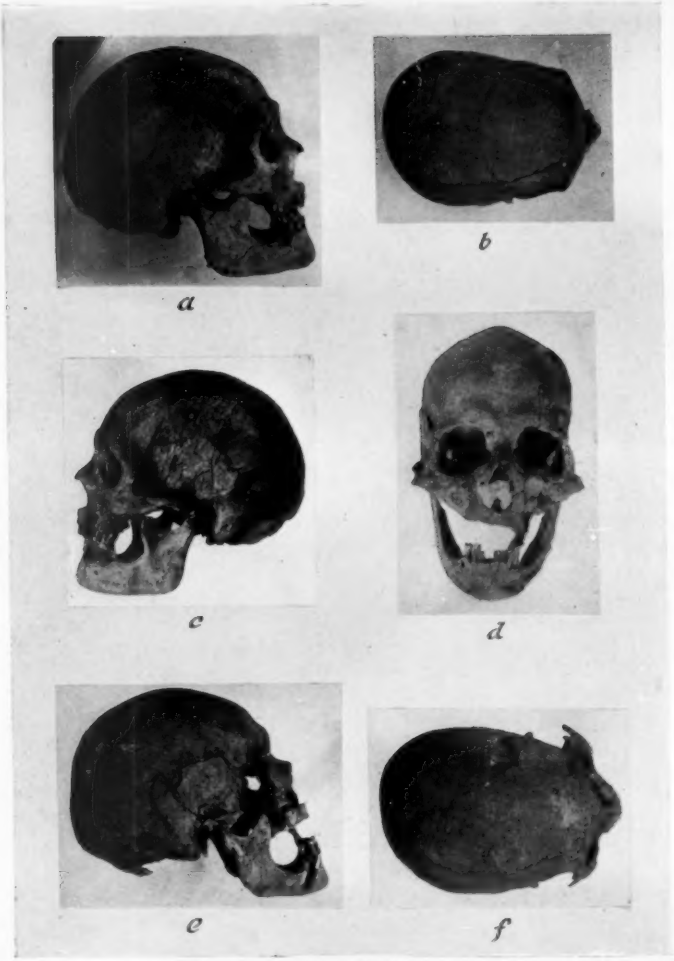

PLATE XXIX

a. EM 26. 3/16. b. EM 26. Type Male adult Long-head. Lower Level, Zone I. 3/16. c. EM 26 Type Long-head. Lower Level, Zone II. 3/16. d. EM 98. 3/16. e. EM 98. f. EM 98. Top view of Long-head (deep in gravel). (All figures are about 3/16 size.)

Long-Heads of the Lower Level. Zone II

EM 26, the type, is an old individual, probably a male. (See plate XXVIII, f; plate XXIX, a, b and c.) The skull is thick-walled, heavy and brittle; condition good although slightly compressed laterally. In color it is a creamy yellow. The lower jaw is harder than the skull and seems too wide for it, although the two were found close together. The restored measurements of the cranium give 187 mm length, 138 mm width, cephalic index 73.8. The nasal opening has sharp borders, nasal bones long, nose prominently arched. The nasal index of 49 shows medium length and breadth. The facial index not allowing for tooth-wear is 85.2 or medium, the face being narrower with less prominent cheeks than the majority of the skulls. The features in common with all long-heads and mesos of the Lower Level are decidedly non-prognathic. The orbital index is 80.6 or low, the orbits being wide for the height. The width of frontal bone at temples, the narrowest part, is 97 mm, the greatest width 112.7 mm, a difference of 15.7 mm. The forehead is low and sloping. Like the other long-heads and mesos, the occipital posterior development is the main contributing factor in the skull's length, its basal part being rugged and with broad surfaces for neck muscle attachment. The lower jaw ramus is broad and long, the angle less obtuse than ordinary, which with the occipital development indicates powerful neck and jaw mechanism.

EM 98, an old male with sagittal suture almost closed, is the same type as EM 26, judging from the indices, although the nose is narrow, nasal index 46.7. (See plate XXIX, d, e and f.) The face is broader and longer, standing forth prominently at the cheeks. This skull is crushed on its left side. The teeth are badly worn and decayed and all molars are shed except one in the upper jaw.

EM 41 is a rather old adult indicated by closing in of part of the sagittal suture. (See plate XXX, a and b.) It appears to be a male and yet an infant accompanied it. The skull actually measures 192 mm long and 134.5 mm wide but is compressed laterally, and my restored measurements are 187 mm and 138 mm respectively, giving a cephalic index of 73.8. The nasal opening

widens strongly in its lower third to 30 mm, the length being 53 mm, nasal index 56.6. The nose is broad at the nostrils although narrow above. The lower nasal border is obscure although not guttered. This is a rugged specimen with massive jaws, teeth much worn some of the molars shed. The forehead slopes strongly as in others of its kind and the superorbital ridges are prominent. These ridges extend about half way outward above the orbits in common with all other skulls from the Fisher site.

EM 81, a much crushed male adult, agrees in general with the type EM 26. The teeth are considerably worn, otherwise in good condition except that the molars of the lower jaw have been shed. The skull is of medium size, 185 mm long, 133 mm wide, cephalic index 71.8. Around the left infra-orbital foramen, it shows signs of disease. All of the cranial sutures are wide open.

From the Big West Mound, I have secured only two specimens. EM 76, a young female adult with infant, is finely preserved and not distorted, although crushed on the left side. (See plate XXX, c, d and e.) In its various indices, it agrees with EM 26. The length of skull is 187 mm, the width 133 mm, cephalic index 71.1. The nasal openings are long, all borders sharp. The jaw angle is about 90 degrees. The teeth, although worn, are all present and in good condition.

WM 42 is a young male adult with the same length and width of skull as WM 76. Although much worn, the teeth are all present and in good condition and, like all of the type, the incisors wear upon each as much or more than the other teeth. The nose is small and slender contrasted with the rather massive face.

SW 1 is the only true long-head found outside of the two big mounds. It lay in one of the smaller mounds at $-48''$ concealed in gravel but I could secure only the cranium and a few limb bones. It represents an old male and is the longest specimen I have found; length 193.7 mm, width 140 mm, height 149 mm which make the cephalic index 72.3 and height-length index 76.9.

Skulls from the Lower Level. General.

EM 44 is a fine young adult which I interpret as a female. (See plate XXX, f.) All cranial sutures are open and the teeth

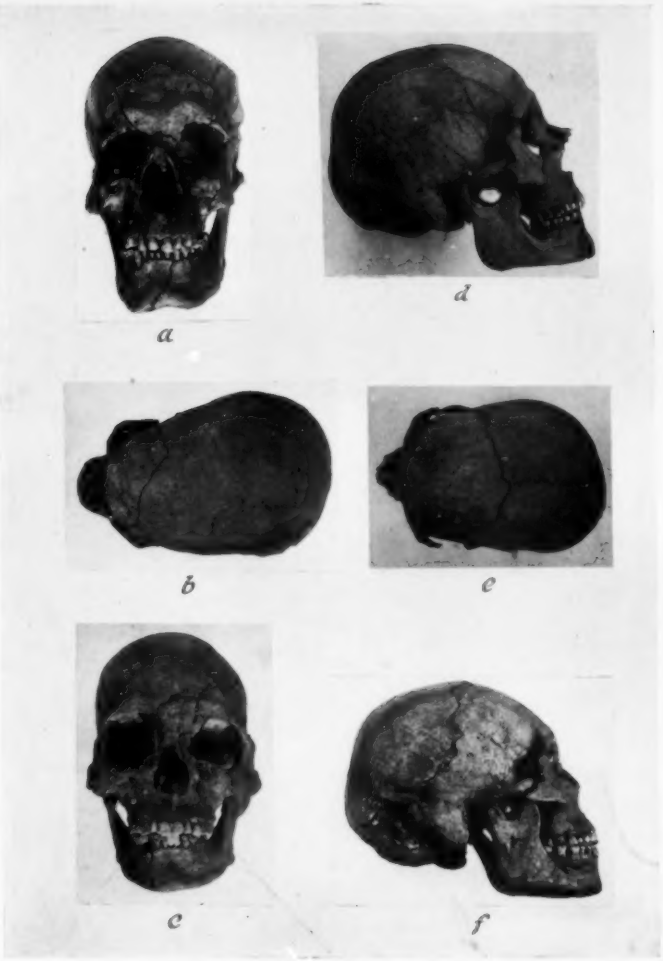

PLATE XXX

a. 3 EM 41. Concealed deep gravel burial flattened on left side. Forearm broken—pierced by bone arrowpoint? This skeleton was directly beneath 3 EM 39. Middle Level, burial with pot. Directly above EM 39 was EM 37. 2/5+. b. EM 41. Long-head. Crushed on left side. 3/16+. c. WM 76. Female Long-head adult from Zone II, Lower Level. 3/16. d. WM 76. Female adult Long-head. Zone II of Lower Level. Concealed pebbles under the head. 3/16. e. WM 76. 3/16. f. EM 44. One of a group of Meso and Long-heads from center of Big East Mound above the type Long-head, EM 26. 3/16+.

PLATE XXXI

Diseased or Damaged Human Bones Left: Right humerus of the type Broad-head EM 19, showing a diseased head. Broken and healed radius of long-head EM 41. The ulna seems to have been pierced by a round pointed object. Lower end of humerus from Gravel Pit, rear view showing wound. Pierced sternum EM 90. Broken and healed tibia shaft from Gravel Pit.

are in good condition. This skull resembles the Long-head WM 76 and yet the nasion-opisthion arc length is only 352 mm. The chin however is far less prominent than in any specimen previously described.

EM 108, being an old individual, does not superficially resemble the type meso or others described, due to alveolar absorption. Most of the teeth are shed and the lower face and jaws have lost their massiveness. Although crushed when found, the restored skull is undistorted and in good condition for measurement. It is that of a male, 182 mm long, 142 mm wide and 145 mm high; cephalic index 77.9, height-length index 79.6. The nose is narrow with obscure lower margins; nasal index 45.6.

EM 57, a powerful young male adult, agrees in general with EM 26, except that the lower nasal borders are somewhat guttered. All teeth are in excellent condition. The two upper incisors are massive and shovel-shaped, the cutting edges depressed between the inner and outer layers of enamel. This skull is badly crushed from resting in gravel upon its left side, where the color is light brown, a darker brown on the other. The nasion-opisthion length measured along the curve is 377 mm, greater than EM 26 or EM 98, which are 369 mm and 366 mm respectively.

WM 61 an adult meso apparently a male, in a semi-concealed grave, lay under the periphery of the Big West Mound where no basal seam was visible beneath the Ash Layer, and may belong to the Middle Level.

WM 46, an old female adult, is another rim burial which may be assigned to Zone I of the Lower Level on the sole evidence that it lay in a semi-concealed grave upon its side without pot or artifacts. The skull measurements, which are doubtful, give a cephalic index of 77.5, height-length 73 and nasal 54.

Notes on the Limb Bones

Curvature of shaft occurs in all limb-bones excepting the humerus. In the femur it is common, often exaggerated anteroposteriorly; lateral and rare in the tibia and fibula; lateral and more common in the radius and ulna. (See plate XXXI.)

Measurements of the various limb bones denote statures rang-

ing from 1744 mm (5 ft 8¾ in.) to less than 1500 mm (4 ft 10 in.), EM 45 being the tallest and EM 65 the shortest. WM 38 and NGP 2 of the Upper Level were rather short and yet their limb bones denote muscular strength not exceeded by any of the others, although EM 57 and EM 48 of the Lower Level were both powerful males. The Middle Level was full of small and rather feeble individuals.

The middle section of the sternum is pierced with a round 7 mm hole in two cases EM 90 and WM 35. Both are mesos taken from semi-concealed graves of the Lower Level.

Skeletal parts display various healed injuries. The type broad-head EM 19 has a bad right humerus, most of the head having disappeared and this bone is considerably shorter than the left. WM 75, a round-head, has a similar affliction. The head is much flattened and the shaft is bent sharply outward at the deltoid prominence. In the old long-head EM 98, the axis and third cervical vertebra are fused together and the atlas is distorted. EM 94, a female round-head, had a crippled ankle shown at the lower end of one tibia and the corresponding surface of its astragalus. One ulna of EM 41, long head, was broken through the center by a pointed object which also smashed the radius, both bones eventually healing although much misplaced. WM 15, a round-head, had one ulna broken and healed in the center of shaft. The radius of WM 35 was fractured, then healed near the wrist. Several tibiae show severe healed breaks. Others bear marks of healed wounds or disease. In adolescents the teeth are in good condition becoming worn down with advancing age when decay or extreme wear results in loss of teeth, the molars disappearing first. Abscess and disease frequently involving the jawbones appear in older individuals.

Summary of Observations on the Fisher Mounds

The following summary is not presented as a statement of conclusions but as a working basis for further study. Stratigraphically considered, the two big mounds appear divisible into layers or levels each consisting of several zones as evidenced by the human burials and relics with particular attention to each

PLATE XXXII

July, 1926, Excavation at south rim of Big East Mound. George Langford exposing the double burial EM 115–116, a male and female of Middle Level with stone, bone and shell artifacts. The ground level is at "A," gravel begins at "B."

grave's plane of origin, measurements of skulls and burial postures.

Upper Level, Zone 1. This is a post-European culture represented near the surface of the two big mounds by trade silver and glass and kaolin beads. In the small Southeast mound aboriginal pieces of bone, copper, shell, and flint accompanied glass beads, silver ornaments, and other European objects. The skeletal evidence is scanty but the skulls, statures and burial postures are probably much the same as in the zone below.

Upper Level, Zone 2. There were no European objects; only notched or stemmed flint or chert arrowpoints, and possibly a few small crude clay pots. The few skeletons ascribed with reasonable certainty to this zone are of moderate stature with short or round high heads, broad noses, short faces and low orbits. No ashes overlay the skeletons which were in various postures upon the back or side facing in no particular direction. WM 38, a male adult, is the type. WS 2, a young adult female, and NGP 2 from the outlying small mounds and "lodge-pits" are additional examples.

Middle Level, Zone 1. The culture is represented by polished bone artifacts, small triangular chert arrowpoints, copper celts, chisel-like stone celts and clay pots crudely made with little or no ornamentation. Here was a varied assemblage of skeletons of from moderate to good stature with all shapes of heads; long, meso and short; broad and meso noses, long and meso faces and low and meso orbits. There were no ashes but head and shoulders were occasionally covered with large gravel Most of the burials occurred at the rim of each large mound although a few were to be found nearer the center and such graves were dug deeply. The burial postures varied as in the level above, although more or less extended upon the back or side. WM 57, 15, and 25 are good examples. These are male adults with short high heads, broad to meso noses, long to meso faces and low orbits. WM 7 and 32 are female adult mesos. EM 100, a young female adult, with long high head, narrow nose, long face and high orbits, was studiously arranged in a crouching posture with an infant beside her. EM 115, 116 and WM 49, round-heads, were accompanied by caches of small triangular chert arrowpoints and polished bone implements.

Middle Level, Zone 2. This section wherein the graves were below ground level, contained the great bulk of human skeletons, clay pots and artifacts, the latter consisting of crude bone, copper polished stone, chert and shell objects. The shell pieces were spoons, pendants and tube beads carved from clam-shells. Small triangular and long slender arrowpoints together with a few leaf-shaped blades comprise the chert pieces. Polished stone artifacts were represented by a few small celts. The clay pots are small to large with bark-like, sometimes smooth surfaces undecorated or covered with "antler-point" designs. The skeletons, mostly female adults and young, are of modest stature and physical development, with short high heads, some of which are comparatively broad, with broad noses, long faces and meso to low orbits. The graves were frequently overlain by beds of ashes mixed with dirt, charcoal, clam-shells and splintered animal bones. The great majority of adults lay upon their backs extended, heads west, feet east. EM 19, a male adult broad-head with rather narrow nose, is the type. EM 21, 39, 71, 72, 80, 94 and 96 are other examples.

Middle Level, Zone 2. Burials in this zone were without post or artifacts. The skeletons are of small stature, with round high heads, narrow noses, long faces and high to low orbits. No ash-beds or debris covered the skeletons, which lay sprawling in various directions. WM 22 is the type, with EM 28, 30, 65 and 66, other examples.

Lower Level, Zone 1. No pots or artifacts of any kind occurred here, nor were there any ashes or debris around the skeletons, the latter lying in pure gravel with only slight discoloration or change in texture above to betray the graves beneath. The skeletons show good stature and physical development, with meso high heads, narrow noses, long faces and meso orbits. These were irregularly crouching burials usually upon the left side with face half up or down, knees and legs not laid close together and faces looking north. There are 4 certain and 8 slightly uncertain cases, the majority male adults, one of which, WM 46, is broad-nosed. EM 42, male adult, is the type. EM 48, 89 and 108 are other good examples.

Lower Level, Zone 2. The culture is scanty; two small pen-

dants with WM 76 and one tube with EM 98 made from marine gastropod shells, and four doubtful flints with EM 26. The skeletons are medium in stature and physical development with long high heads, narrow to meso noses, long faces and meso to low orbits. EM 41 is broad-nosed. Traces of ashes appeared above the head of a female adult, WM 76. EM 41 and WM 76 were accompanied by infants. Of 7 adults surely in this zone and 2 slightly uncertain, all were crouching burials studiously arranged with knees and legs together, faces looking north. 8 lay upon the left side, 1 upon the right.

The Fisher Site Correlated with a Neighboring Locality

In the September 1919 issue of The American Anthropologist, I described "The Kankakee Refuse Heap", a sharply restricted pre-European camp site on the Kankakee River about 1½ miles above where it empties into the Illinois. The locality unlike others in this region, abounds in small triangular chert arrowpoints and rejects, utilized bone and antler, rude hammerstones, grooved sandstone pieces, broken shells, burned animal bones and potsherds tempered with both shell and grit. Many of the latter bear "antler-point" decoration. Recently I have found two inconspicuous burial mounds upon the site but the human bones buried in clay are too poorly preserved for a study of their characteristics, except that they were of small people.

My article referred to the locality as one unique in this region, mainy because of the great abundance of small triangular and, slender chert arrowpoints together with the rejects and refuse of their manufacture. It also contains shell spoons, polished bone cylinders, edged hammerstones, grooved sandstones, polished antler points cut or bored, hollowed-out deer and elk phalanges, and bone pins. These and the potsherds, also the animal bones, agree with those from the Fisher site. Clay deposits exposed on the Kankakee River Banks offered abundant material for the manufacture of pottery. The culture of the surrounding country is characterized by notched and stemmed arrowpoints made from flint, chalcedony and other stone, and some of these appearing among the "Refuse-heap" relics may be correlated with the Upper

Level of the Fisher site. Not one piece of punch-stamped or rouletted ware has appeared among the numerous "Refuse-heap" potsherds. These facts, together with other evidence, go to show that the "Kankakee River Refuse Heap" and Fisher Middle Level are the same and preceded the prevailing and better-known culture of this region.

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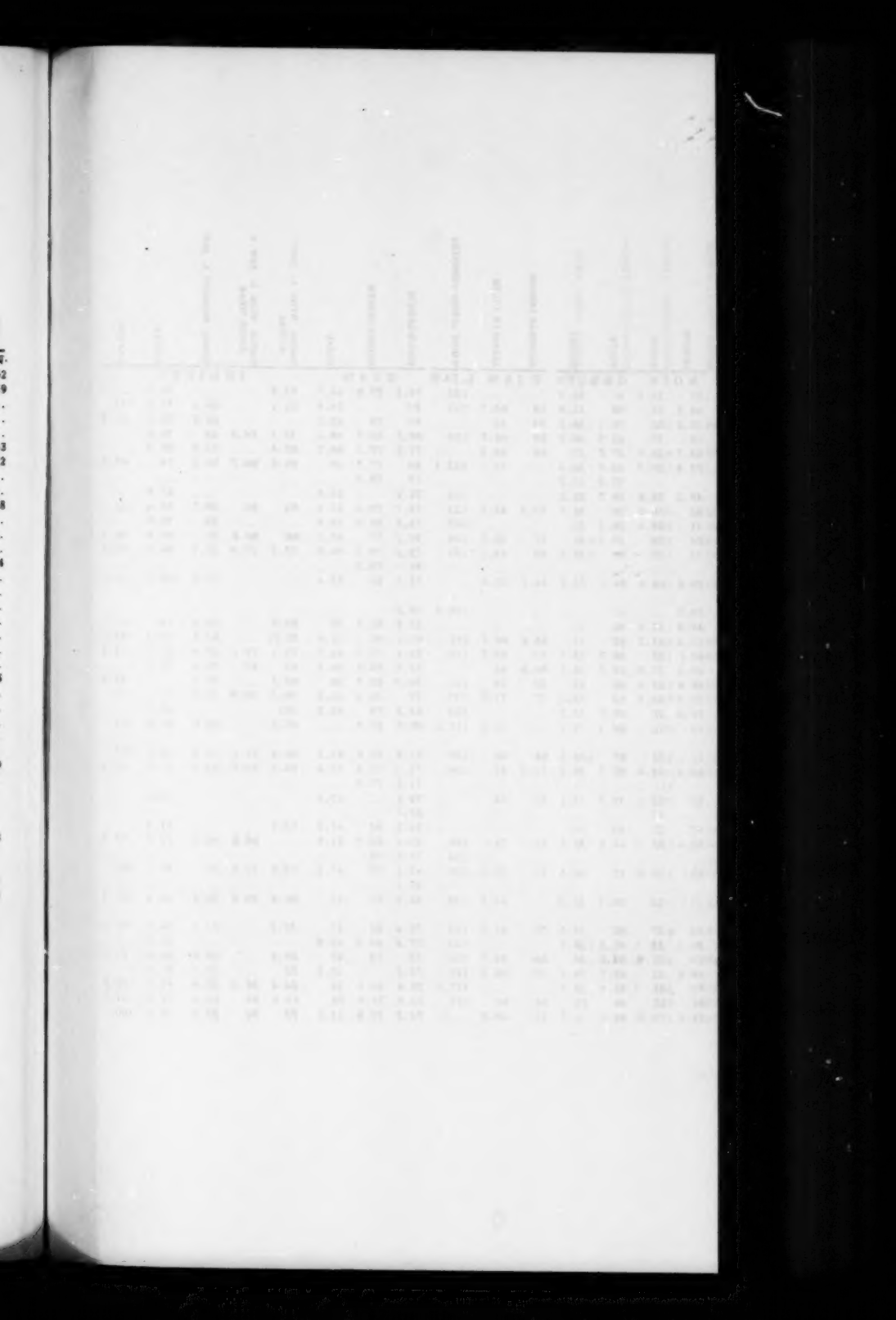
Addendum

Since the main body of this article was written, work has continued almost to completion on the two big mounds, resulting in the discovery of 15 more human burials and several clay pots. WM 87 a young female adult lay at $-48''$ in a concealed grave with three doubtfully worked flints beneath her head. This was a crouching burial on the left side, head west, feet east. Directly above it was another skeleton at $-12''$. WM 87 has a cephalic index of 68.3, length height 76.1, nasal 60, facial 95.2, orbital 88. These denote a long, high skull with unusually broad nose. The face is rather small. In this same excavation, a small female adult at $+18''$ lying on another at $+12''$, both with heads west, feet east. The former WM 84 lay upon the left side. She wore a necklace of small shell beads which crumbled to powder when exposed. Near the head was a small pot containing a clam-shell spoon. The pot is grit-tempered, smooth-surfaced and without decoration of any kind. Previously I had found sherds of similar pots in the Upper Level diggings but no whole ones. The two skeletons were directly over a small child's skeleton, the latter at $-30''$ without relics. These were all near the east rim of the Big West Mound.

More might be said of certain burials—some previously described—which presented peculiar features. Several originating near the Black Seam may be intrusives.

In Zone I Middle Level or Upper Level, I found graves in "previously disturbed areas." Some of these areas were disturbed by burrowing animals and modern excavations but others seem to have been dug into by the aborigines themselves. EM 101 and 102 were dug graves traceable upward almost to the Black Seam. EM 83 and EM 100 lying in the Ash Layer showed no graves dug for them, the side wall sections presenting no clue except to suggest

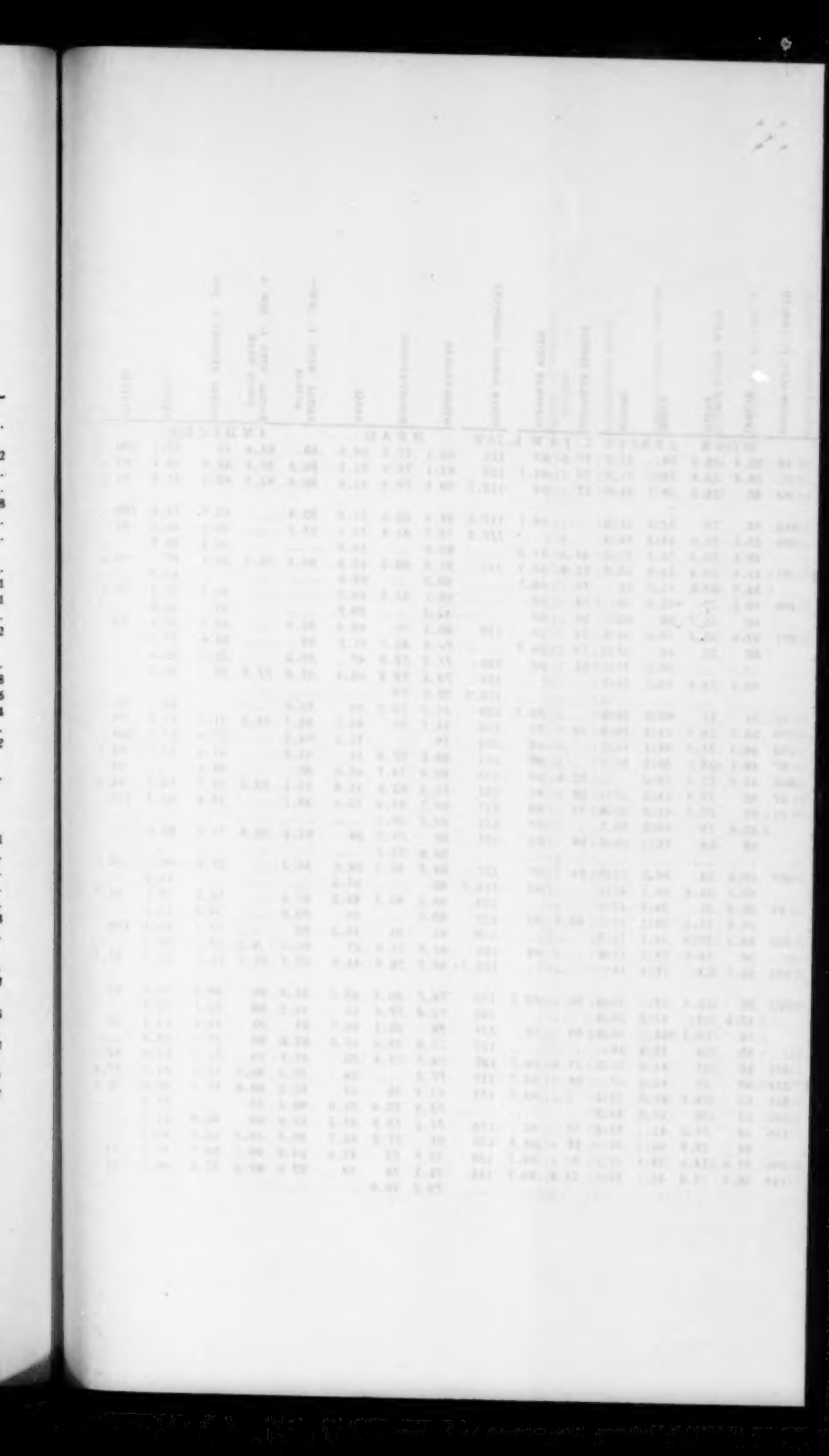
			Clavicle length	Humerus: length	Humerus: diam. of head	Humerus: width of lower end	Radius length	Ulna length	Femur: bicondylar length	Femur: diameter of head	Femur: width of lower end	Tibia: length without spine	Tibia: width of upper end	Tibia: transverse diam. of shaft	Tibia: ant.-post. diam. of shaft	Fibula length	Os. Innominatum: length	Os. Innominatum: width
M	38	Male adult	146	311	45	63.5	245	270	432	49	85.7	355	79.5	23.8	31	349	210	162
S	2	Young female adult	152	298	37	57	235	254	412	41	71	343	70	21	29	336	210	159
GP	2	Female adult	146	...	48	60	246	267	...	....	....	...	76	22	32	...	...	...
M	39	Old male	...	346	42.9	58.7	264	...	473	49	76.3	387	76.2	20.6	38	...	...	...
	7	Female adult	...	321	....	60	263	...	457	....	....	372	....	....	....	...	...	...
	57	Male adult	160	338	44	60	262	282	468	46	....	...	76	20.6	35	...	228	163
	67	Old male	159	324	45	65	260	285	449	47	84	381	79.5	23.5	33.3	368	222	152
	15	Male adult	...	305	40	59	256	...	...	....	....	...	....	....	....	...	...	...
	25	Male adult	168	330	41	59	...	...	454	44	83	380	79	24	32	...	...	...
	32	Female adult	...	...	42.9	63.5	...	...	450	46	85.7	390	78	23.8	36.5	...	225	168
	47	Female adult	143	271	36.5	50	231	248	438	46	74	343	....	21	28.5	...	203	...
	49	Male adult	...	325	43	61	...	...	...	....	....	...	....	....	....	...	...	...
M	83	Female adult	143	318	39	60	...	...	441	46	78	390	73	22	30	...	...	...
	101	Male adult	151	314	42	62	250	272	440	46	78	...	....	20.6	35	...	218	154
	102	Male adult	...	340	44	....	...	...	474	44	83	407	80	22.2	34.5	...	...	...
	100	Young female adult	136	298	37	54	238	...	414	43	75	335	69	18	26	...	...	...
	109	Male adult	165	329	42	59	...	276	440	47	81	369	82	22	37.5	...	...	...
	111	Female adult	...	338	43	55	...	...	...	....	....	...	....	....	....	...	...	...
	115	Female adult	133	298	38	51	232	248	406	40	70	330	64	18	27	...	...	...
	125	Young female adult	...	324	36.5	56	257	277	457	44	72	...	....	....	....	...	...	...
	28	Female adult	143	...	....	....	228	...	...	....	....	356	....	22	29	...	...	...
	72	Female adult	140	304	38	56	232	...	407	43	76	348	68	19	30	347	210	155
	69	Female adult	...	...	....	....	...	...	408	39	67	332	60	21	28	331	...	...
	80	Adolescent	...	314	35	55	...	258	...	....	....	...	....	....	....	...	...	...
	91	Female adult	...	303	35	54	225	245	413	41	75	...	....	....	....	...	...	...
	96	Male adult	...	...	....	....	...	...	441	46	80	...	....	....	....	...	...	...
M	53	Female adult	...	305	40	57	245	265	...	....	....	365	73	22	29	...	203	...
	66	Female adult	...	294	37	60	241	261	440	44	74	362	70	23	30.2	352	210	149
M	30	Aged female	143	289	38	55	...	...	...	....	....	...	....	....	....	...	...	...
	65	Female adult	140	289	29	49	235	248	413	38	70	332	66	17	27	343	...	...
M	22	Male adult	142	...	41	59	233	260	...	....	....	...	....	....	....	...	...	...
	24	Aged female	142	286	35	51	...	...	385	40	70	323	67	17.5	25	318	...	...
M	44	Female adult	159	356	46	63	...	...	497	49	83	412	79	25	35	394	229	168
	45	Male adult	168	343	46	65	...	298	490	....	....	414	....	24	38	400	238	171
	48	Male adult	159	345	43	64	...	...	...	....	....	...	....	....	....	...	...	...
	57	Male adult	152	325	44	62	257	273	446	49	82	362	81	22	32	362	216	152
	74	Male adult	...	...	....	...	...	280	456	44	76	375	75	21	35	...	...	168
	88	Male adult	...	...	....	....	...	...	454	46	82	...	....	....	....	...	...	...
	89	Male adult	157	...	44.4	60	...	275	432	47.5	76	...	....	19.3	33	...	206	156
	103	Female adult	...	...	....	....	...	...	441	43	76	371	70	21	32	369	...	...
	108	Old male	163	...	....	....	...	...	...	....	....	375	80	20.6	33.3	...	...	...
	113	Male adult	143	313	43	62	...	...	432	46	83	369	77	21	33	...	...	...
	121	Male adult	143	300	43	61	245	...	403	46	80	343	76	19.5	44.5	...	...	...
M	61	Female adult	143	312	41	57	255	283	...	47.6	....	...	....	....	....	...	210	...
M	26	Old male	151	...	....	....	...	...	...	....	....	...	....	....	....	...	...	...
	41	Old male	...	311	44	64	...	...	...	....	....	...	....	....	....	...	...	...
	81	Male adult	155	316	43	59	...	...	451	48	81	368	78	22	35	365	...	...
	98	Old male	162	...	....	....	...	...	...	....	....	...	....	....	....	...	...	...
M	76	Female adult	152	328	41.3	58.5	257	271	454	45.5	79	375	73	20.5	33.3	366	...	..



LEVEL	SPECIMEN NUMBER	AGE & SEX	+ ABOVE OR − BELOW GROUND LEVEL IN INCHES	GREATEST LENGTH	GREATEST WIDTH	NASION-BREGMA HEIGHT	BREGMA-BAR HOLE HEIGHT	NASION-OPISTHION ARC LENGTH	NASION-BREGMA ARC LENGTH	NASION-BREGMA STRAIGHT LENGTH	NASION-BREGMA CURVATURE	WIDTH AT TEMPLES
				CRANIUM					FRONTAL			
MIDDLE & UPPER	EM 78	Old male	+12	176	138	137	.....	346	119	.....	....	9
	126	Young	−18	177	147	.....	.....	...	121	.....	....	9
	131	Female adult	−18	175	140	133	.....	359	110	.....	....	8
	WM 4	Male adult	+12	168	150	.....	119	...	134	117.5	28.6	10
	7	Female adult	+24	184	143	143	.....	356	120	.....	....	9
	15	Male adult	0	184	147	143	117.5	372	127	115	23.5	9
	16	Old female	+18	181	143	133	.....	...	.....	.....	....	9
	27	Old female	+12	*173*	*130*	.....	.....	...	.....	.....	....	9
	32	Female adult	+ 6	167	131.5	133	120	311	114	106	22	9
	39	Old male	0	181	139	146	.....	375	127	.....	....	9
	57	Male adult	+12	178	*147*	137	115.9	358	128	120	19.5	9
	67	Old male	0	180	143	141	117.5	352	127	114	24	10
	GP 1	Old male	0	184	149	146	.....	*375*	127	.....	....	9
	3	Female adult	?	175	137	143	122	367	128.5	114	25.4	9
MIDDLE	WM 5	Female adult	− 9	*173*	*132*	.....	.....	...	124	.....	....	*8*
	14	Young	− 3	167	*138*	137	.....	...	.....	.....	....	...
	49	Male adult	−12	175	146	140	.....	346	127	.....	....	9
	66	Female adult	−12	171	141	132	111	343	114	105	22	9
	70	Female adult	+30	174	144	*138*	114	354	124	112.5	23.5	9
	75	Young	−18	168	145	139	.....	*350*	115	.....	....	*10*
	S 1	Male adult	−24	184	142	138	109.5	356	121	117.5	23.8	10
	W 1	Male adult	−36	181	135	*143*	.....	371	131	.....	....	9
	NW 1	Young	−18	164	*132*	*137*	.....	337	124	.....	....	9
	EM 28	Female adult	− 6	163	135	136	114	340	114	103	20.6	8
	43	Old female	−24	181	129	140	111	357	124	120	22.5	9
	46	Female adult	−36	181	130	141	.....	343	.....	.....	....	9
	73	Male adult	+ 6	*176*	140	.....	.....	...	124	.....	....	9
	75	Male adult	−24	*181*	*148*	.....	.....	...	.....	.....	....	9
	82	Female adult	−36	165	140	*137*	.....	343	.....	.....	....	9
	109	Male adult	−18	181	150	*149*	120	380	130	117.5	22.5	10
	110	Male adult	− 9	*188*	146	*143*	.....	365	127	.....	....	9
	111	Female adult	−36	181	150	143	.....	368	130	.....	....	10
	115	Female adult	−36	175	*149*	.....	.....	...	125	.....	....	9
	125	Female adult	−18	161	133	*124*	.....	341	119	.....	....	9
LOWER & MIDDLE	EM 44	Female adult	−24	*179*	*135*	*145*	.....	359	124	.....	....	9
	45	Male adult	−30	*176*	*137*	*144*	.....	362	133	.....	....	9
	57	Male adult	−24	*185.5*	*136.5*	*145*	.....	377	133	.....	....	9
	74	Male adult	−24	*178*	*134*	.....	.....	*368*	119	.....	....	9
	103	Female adult	−36	175	*132*	148	122	365	122	111	24	9
	113	Female adult	−24	185	138	*140*	.....	368	121	.....	....	9
	WM 61	Female adult	−24	183	136	*144*	.....	365	127	.....	....	9

NASION-BREGMA STRAIGHT LENGTH	NASION-BREGMA CURVATURE	WIDTH AT TEMPLES	WIDTH AT MALAR PROCESS	WIDTH AT CORONAL PROCESS	BIZYGOMATIC WIDTH	NASION-MENTON LENGTH	INCISOR TOOTH WEAR	NASION-ALEV. PT. LENGTH	BASION-NASION LENGTH	BASION-ALEV. PT. LENGTH	NOSE LENGTH	NOSE WIDTH	ORBIT WIDTH	ORBIT HEIGHT
FRONTAL BONE					FACE						NOSE		ORBIT	
.....	....	91	102	114	130	122	....	....	.....	...	57	25.5	41	33.
.....	....	96	103	118	122	.....	....	60	.....	...	44.5	24	38	33.
.....	....	87	102	110	127	111	3.2	70	102	89	50.8	23	38.1	36.
117.5	28.6	102	114	128	146	.....	3	. ..	.....	...	55	27	42.9	38.
.....	....	91	102	*111*	124	.....	....	....	110	90	48.2	26.5	*37.7*	*33*
115	23.5	97	111	119	150	*119*	11.1	....	117	115	52.4	*26.2*	42.6	33.
.....	....	91	100	.....	.....	.....	....	....	.....	...	....	....	37.8	30.
.....	....	91	102	.....	.....	102	....	....	.....	...	*49.2*	26.5	39.7	33.
106	22	93.7	105	105.5	132	111	0	67	96	98	45	30.2	38	31.
.....	....	95	105	112	142	.....	....	71	101	89	51	25.4	36.8	*35*
120	19.5	95	111	117	143	.....	4.8	....	105	101	54	26	39.7	37
114	24	103	113	117	*144.5*	.....	7.9	69	114	105	53	27	42	37.
.....	....	95	106	118	.....	.....	....	....	113	...	.....	....	....	..
114	25.4	92	103	117	127	.....	....	68	103	102	50.8	24.6	34.1	33.
.....	....	*87*	95	111	.....	*102*	....	54	.....	...	39.7	....	....	..
.....	....	.....	.....	.....	*133*	102	....	....	.....	...	44.4	22.3	40	*33*
.....	....	92	108	114	*139*	119	....	70	108	100	52.4	27.5	*42*	35
105	22	92	105	115	136.5	108	0	62	101.5	103	44	27	39.7	33.
112.5	23.5	97	105	121	133	113	0	66.7	.....	...	49.2	27.8	39.7	31.
.....	....	*100*	*108*	*114*	132	115	....	*68*	*103*	*95*	50.8	*25.4*	*42*	31
117.5	23.8	105	113	124	138	126	0	70	106	97	*55.6*	23.8	42	33.
.....	....	95	105	.....	127	130	....	76	.....	...	*55.6*	*27*	*39.7*	*33*
.....	....	92	99	116	118	114	....	68	100	*87*	53	....	*38.1*	*36*
103	20.6	87	98	109	130	115	4.8	70	101	98	51	22	37	36.
120	22.5	97	108	110	*127*	115	4.	69	105	102	48.4	24.6	39.7	33.
.....	....	94	108	.....	.....	.....	....	....	114	...	....	....	....	..
.....	....	92	106	116	140	.....	....	....	*119*	...	57	26.2	39.7	33.
.....	....	98	.....	.....	140	.....	....	....	.....	...	....	27	....	..
.....	....	92	108	.....	*127*	119	....	....	.....	98	*57*	*27*	43	35
117.5	22.5	101	109	125	*143*	*127*	3.	*69.8*	113	106	52.4	27	43.6	*31.*
.....	....	98	*110*	119	*144*	.....	....	....	.....	...	....	....	....	..
.....	....	102	108	125	130	122	0	71.5	111	112	50	23.8	42	36.
.....	....	98	110	124	.....	.....	....	....	.....	...	....	....	....	..
.....	....	92	102	113	122	111	0	65	*93.7*	95	51	23	38.5	33.
.....	....	94	111	113	*133*	119	....	68	*118*	108	54	25	42	34.
.....	....	95	111	120	.....	117	4.7	66.7	.....	...	50.5	23	41.3	31.
.....	....	95	105	114	*140*	*123.8*	....	68.3	*116*	*106*	*54*	*25.4*	42.5	35
.....	....	92	102	114	143	117	....	64	.....	...	49.2	25	39.7	34.
111	24	91	105	111	*135*	*114*	3.2	66.7	106	*103*	*48*	*25*	38.1	33.
.....	....	91	104	118	*132*	124	2.	75	*108*	*105*	54	27	*40*	*35*
.....	....	95	102	114	*130*	117	0	68.3	111	111	52.4	23.8	40.5	31.

INCISOR TOOTH WEAR	NASION-ALEV. PT. LENGTH	BASION-NASION LENGTH	BASION-ALEV. PT. LENGTH	NOSE LENGTH	NOSE WIDTH	ORBITS WIDTH	ORBITS HEIGHT	U. JAW ALEVOLAR LENGTH	U. JAW ALEVOLAR WIDTH	L. JAW WIDTH ACROSS CONDYLES	HEAD WIDTH-LENGTH	HEAD HEIGHT-LENGTH	HEAD NASAL	INDICES FACIAL WITH L. JAW—ACTUAL	INDICES FACIAL WITH L. JAW & TOOTH WEAR	INDICES FACIAL WITHOUT L. JAW	INDICES ORBITAL	INDICES NATHIC
ACE				NOSE		ORBITS		U. JAW		L. JAW	HEAD			INDICES				
...	....	.....	...	57	25.5	41	33.3	....	....	133	78.4	77.8	44.7	93.8	....	....	81.2	.....
...	60	.....	...	44.5	24	38	33.3	54	66.7	117	*83*	....	53.9	81.1	....	49.1	86.4	113
3.2	70	102	89	50.8	23	38.1	36.5	54	63	.....	80	76	45.2	.....	....	55.1	95.8	87.2
3	....	.....	...	55	27	42.9	38.1	54	66.7	105	*88.7*	83.9	*49.1*	*82.6*	*84.9*	48	88.8	.....
...	....	110	90	48.2	26.5	*37.7*	*33*	54	68.3	.....	77.5	*77.6*	49.7	87.4	....	52.4	*87.5*	.....
1.1	....	117	115	52.4	*26.2*	42.6	33.3	....	76	133.4	80	77.7	50	80.6	86.7	44.6	78	97.8
...	....	.....	...	....	....	37.8	30.2	....	....	.....	79	73.7	....	.....	....	....	.....	.....
...	....	.....	...	*49.2*	26.5	39.7	33.3	....	....	114	75.2	....	*53.8*	.....	....	....	83.8	.....
0	67	96	98	45	30.2	38	31.7	55.5	63.5	123	78.7	79.6	67.1	84	84	50.7	83.4	102
...	71	101	89	51	25.4	36.8	*35*	....	....	127	76.8	80.6	49.8	.....	....	50	95.8	.....
4.8	....	105	101	54	26	39.7	37	*57*	66.5	134	*82.5*	77	48.1	86	89.3	51	80.6	96.1
7.9	69	114	105	53	27	42	37.5	*60*	*68.5*	133	79.4	78.3	50.9	*77.9*	*83.4*	47.7	89.2	92.1
...	....	113	...	....	....	....	....	....	....	.....	81	79.3	....	.....	....	....	.....	.....
...	68	103	102	50.8	24.6	34.1	33.9	54.5	65.6	....	78.3	82	48.4	....	.....	53.6	100.5	99.2
...	54	.....	...	39.7	....	....	....	....	....	104.8	76.3	....	....	.....	....	....	.....	.....
...	....	.....	...	44.4	22.3	40	*33*	....	....	.....	*82.8*	81.8	*50*	80.6	....	44.6	78	97.8
...	70	108	100	52.4	27.5	*42*	35	50.8	*66.7*	127	83.4	80	52.4	*85.6*	....	*50.3*	*83.3*	92.6
0	62	101.5	103	44	27	39.7	33.5	*53*	66.7	118	82.4	77.1	61.3	79.1	79.1	45.4	84.3	101.4
0	66.7	.....	...	49.2	27.8	39.7	31.5	50.8	65	.....	82.7	79.3	56.5	85	85	50.1	79.3	.....
...	*68*	*103*	*95*	50.8	*25.4*	*42*	31	*52*	*64*	121	*86.3*	82.7	50	87.1	....	51.5	.....	*92.2*
0	70	106	97	*55.6*	23.8	42	33.3	*57*	71.4	127	77	75.2	42.8	90.9	90.9	50.7	79.2	91
...	76	.....	...	*55.6*	*27*	*39.7*	*33.3*	....	....	*128*	*74.5*	*79*	*48.5*	*102*	....	....	83.8	.....
...	68	100	*87*	53	....	*38.1*	*36.5*	....	71.4	117.5	*80.7*	*83.5*	....	97.2	....	53.6	95.8	87
4.8	70	101	98	51	22	37	36.5	52	60	130	82.8	83.4	43.1	88.4	92.1	53.8	98.1	97
4.	69	105	102	48.4	24.6	39.7	33.3	*52.4*	61	124	71.2	77.3	50.8	90.5	93.6	54.3	83.8	97.1
...	....	114	...	....	....	....	....	....	....	.....	71.8	77.9	....	.....	....	....	.....	.....
...	....	*119*	...	57	26.2	39.7	33.1	54	64	.....	79.5	....	45.8	.....	....	....	83.3	.....
...	....	.....	...	....	27	....	....	....	....	.....	*81.7*	....	....	.....	....	....	.....	.....
...	....	.....	98	*57*	*27*	43	35	....	....	.....	84.8	83	47.3	93.7	....	....	81.3	.....
3.	*69.8*	113	106	52.4	27	43.6	*31.7*	62	76	140	*82.8*	*82.3*	51.5	.....	90.8	48.8	*72.7*	93.8
...	....	.....	...	....	....	....	....	....	....	124	*77.6*	*76*	....	.....	....	....	.....	.....
0	71.5	111	112	50	23.8	42	36.5	57	68.3	130	82.8	79	47.6	93.8	93.8	55	87	101
...	....	.....	...	....	....	....	....	....	....	.....	85.1	....	....	.....	....	....	.....	.....
0	65	*93.7*	95	51	23	38.5	33.3	....	*63.5*	120	82.6	77	45	90.9	90.9	53.2	86.4	*101.3*
...	68	*118*	108	54	25	42	34.5	56	63.5	119	*75.4*	*81*	47	*89.4*	....	*51.1*	94.5	91.6
4.7	66.7	.....	...	50.5	23	41.3	31.7	....	....	133	*77.8*	*81.8*	*45.5*	.....	....	....	76.7	.....
...	68.3	*116*	*106*	*54*	*25.4*	42.5	35	58	66.7	132	*73*	*78*	47	*88.4*	....	48.8	*82.3*	*91.3*
...	64	.....	...	49.2	25	39.7	34.9	*50*	68.3	121	*75.2*	....	50.8	82	....	55.5	87.9	.....
3.2	66.7	106	*103*	*48*	*25*	38.1	33.3	....	....	117.5	75.4	84.5	52	*84.4*	*86.8*	*49.4*	87.4	*97.1*
2.	75	*108*	*105*	54	27	*40*	*35*	*54*	*65*	125	74.6	*75.6*	50	*93.9*	*94*	*56.8*	*87.5*	*97.2*
0	68.3	111	111	52.4	23.8	40.5	31.7	57	68.2	.....	*74.3*	*78.6*	43.5	*90*	*90*	*52.5*	78.2	100



LEVEL	SPECIMEN NUMBER	AGE & SEX	+ ABOVE OR − BELOW GROUND LEVEL IN INCHES	GREATEST LENGTH	GREATEST WIDTH	BASION-BREGMA HEIGHT	BREGMA-EAR HOLE HEIGHT	NASION-OPISTHION ARC LENGTH	NASION-BREGMA ARC LENGTH	NASION-BREGMA STRAIGHT LENGTH	NASION-BREGMA CURVA-
				CRANIUM						FRONT	
UPPER	WM 38	Male adult	+12	176	141	136	114	365	127	115	23.5
	WS 2	Young female adult	−18	168	140	132	108	342	117	103	23.5
	NGP 2	Old female adult	0	174	140	*133*	114	356	127	119	22.5
MIDDLE	WM 25	Male adult	+18	*172*	*140*	*143*	.....	362	127	.....	.....
	26	Female adult	+18	179	141	146	.....	362	124	.....	.....
	45	Young	−12	174	146	.....	.....	*363*	127	.....	.....
	47	Female adult	−12	169	138	136	115	...	132	116	27
	51	Male adult	−12	173	139	.....	.....	...	130	.....	.....
	EM 37	Male adult	+18	173	149	145	116	364	130	119	22
	38	Female adult	+18	176	143	.....	119	...	127	112.7	25.4
	69	Male adult	+12	173	149	138	.....	356	114	.....	.....
	83	Female adult	+ 6	*178*	*139*	*147*	.....	378	133	.....	.....
	100	Young female adult	+12	174	124	*135*	.....	362	122	.....	.....
	101	Male adult	+ 9	182	137	*143*	118	380	130	120.7	25.4
	102	Male adult	0	185	139	*137*	.....	374	127	.....	.....
	2	Female adult	−18	175	*160*	138	.....	...	121	.....	.....
	19	Male adult	−18	173	150	138	117.5	346	121	113	20.6
	21	Young	0	*167*	132	.....	.....	...	.....	.....	.....
	39	Female adult	−12	172	138	134	115	*349*	117.5	119.5	22.2
	71	Female adult	−15	*165*	150	130	.....	340	121	.....	.....
	72	Female adult	−18	170	145	*141*	119	356	121	111	23.8
	80	Young	−24	152	138	137	.....	346	114	.....	.....
	91	Female adult	0	*176*	*143*	*141*	112.7	*352*	121	109.5	23
	94	Female adult	−30	175	140	134	111	348	114	104	19
	95	Young	−36	172	146	132	.....	355	130	.....	.....
	96	Male adult	−36	*175.5*	146	*149*	.....	365	127	.....	.....
	WM 24	Aged female	−12	*168*	*135*	.....	.....	...	111	.....	.....
	40	Female adult	−30	176	141	145	.....	370	132	.....	.....
	53	Female adult	−12	159	144	.....	.....	330	121	.....	.....
	EM 30	Aged female	−26	164	133	133	106	336	114	103	22
	65	Female adult	−36	170	141	135	106	345	117.5	105	22
	WM 22	Old male	−40	170	137	133	108	343	122	109.5	21
LOWER	EM 42	Male adult	−30	*182.5*	*140*	*147*	116	352	133	122	27
	48	Male adult	−24	*190*	*149*	*148*	124	392	133	125	29
	89	Male adult	−36	181	*142*	144	121	376	134	119	23.5
	108	Old male	−36	182	142	145	117.5	365	130	121	26
	121	Male adult	−42	186	139	*144*	120.7	...	124	114	22.2
	WM 46	Female adult	−30	*178*	138	112.7	112.7	359	118	111	17.5
	EM 26	Old male	−50	*187*	*138*	139	108	369	125	124	23
	41	Old male	−36	*187*	*138*	*141*	119	370	129	121	20.6
	81	Male adult	−42	185	*133*	*140*	113	355	122	108	22.2
	98	Old male	−48	*190*	135	*147*	117.5	366	127	124	21
	WM 42	Male adult	−30	*187*	*136*	*146*	112	372	124	123.5	22.2
	76	Female adult	−30	187	133	*146*	116	*378*	*128*	120	22
	SW 1	Old Male	−48	193.7	140	*149*	.....	378	.....	.....	.....

NASION-BREGMA ARC LENGTH	NASION-BREGMA STRAIGHT LENGTH	NASION-BREGMA CURVATURE	WIDTH AT TEMPLES	WIDTH AT MALAR PROCESS	WIDTH AT CORONAL SUTURE	BIZYGOMATIC WIDTH	NASION-MENTON LENGTH	INCISOR TOOTH WEAR	NASION-ALEV. PT. LENGTH	BASION-NASION LENGTH	BASION-ALEV. PT. LENGTH	NOSE LENGTH	NOSE WIDTH	O
FRONTAL BONE						FACE						NOSE		
27	115	23.8	92	104	116	145	116	6.4	71	98	98	52.4	28.6	3
17	103	23.8	92	98	113	132	106	0	60	104	97	46.2	23.8	3
27	119	22.5	87	111	116	148	*119*	3.2	70	108	*98*	55	28.5	3
27	.....	....	100	114	121	*143*	122	....	*70*	110	110	54	28	4
24	.....	....	101	110	118	*145*	138	....	*67*	101	94	47.6	25.4	4
27	.....	....	90.5	95	114	113	.....	....	57	.....	...	39.5	22.5	3
32	116	27	92	100	108	132	114	0	68.3	101.5	92	52.4	25.4	3
30	.....	....	102	111	116	.....	116	6.4	68.3	.....	...	52.4	27.5	*4*
30	119	22	101	113	126	152	.....	....	75	110	100	54.5	27	4
27	112.7	25.4	95	103	116	130	.....	....	65	.....	...	44	25.2	3
14	.....	....	90	98	116	135	116	....	65	103	102	52.4	25.4	3
33	.....	....	99	105	122	132	124	....	74.5	.....	...	52	29	*4*
22	.....	....	86	99	*111*	*128*	127	....	*72*	.....	...	....	....	*3*
30	120.7	25.4	95	105	112	*135*	*124*	0	67	.....	...	52.4	25.4	*4*
27	.....	....	95	109	*114*	*143*	.....	....	....	.....	...	....	....	.
21	.....	....	100	110	121	143	121	....	....	100	95	54	27	4
21	113	20.6	94	107	119	147	124	0	76	100	99	56.3	26.3	4
....	.....	....	86	95	110	118	112	....	68	*97*	*105*	49.5	25.3	3
17.5	119.5	22.2	95	103	112	125	116	7.9	64	105	97	49.2	25.1	3
21	.....	....	89	102	114	135	108	....	64	102	100	47.6	22.2	3
21	111	23.8	89	106	120	133	124	0	70	92	87	56	27.5	4
14	.....	....	91	102	113	130	122	....	69.5	90	95	57	25.5	4
21	109.5	23	95	106	117	.....	127	0	69.8	.....	...	55.6	25	3
14	104	19	92	105	117	134	122	3.2	70	.....	...	52	26	3
30	.....	....	.....	.....	113	.....	.....	....	....	*97*	...	....	....	.
27	.....	....	92	101	118	*132*	127	....	76	109	*107*	47.6	28	*3*
11	.....	....	91	101	116	103	.....	....	62	.....	...	49.2	26.4	4
32	.....	....	90.5	101.5	116	130	114	....	68	95	91	*50.8*	25	3
21	.....	....	91	108	117.5	*129*	*117*	....	70	.....	...	50.8	25.4	3
14	103	22	87	98	106	127	.....	17.0	65	100	100	49.2	23.8	3
17.5	105	22	91	105	114	138	119	0	70	101	...	54	25.4	3
22	109.5	21	97	105	105	*132*	114	7.9	68	110	102	52.7	23	4
33	122	27	105	119	122	*145*	*124*	6.4	*70*	*130*	*122*	*56*	*25.4*	4
33	125	29	100	113	122	*140*	125	11.1	77.8	.....	...	55.6	25	4
34	119	23.5	99	110	121	145	131.8	0	77.5	.....	...	54	25.5	4
30	121	26	94	111	117	134	*111*	9.5	*66.7*	113	...	57	26	3
24	114	22.2	97	106	108	138	121	3.2	71	*114*	*105*	54	27	4
18	111	17.5	95	103	*112*	*132*	114	6.	*69.8*	*117.5*	*114*	50	*27*	4
25	124	23	97	110	112.7	132.7	112.7	6.4	60	110	105	52	25.5	4
29	121	20.6	.....	103	.....	*130*	117.5	6.4	73	*128*	*126*	53	30	4
22	108	22.2	92	103	.....	*130*	114	3	61	*114*	106	54	*25.2*	4
27	124	21	98	103	114	*145*	130	0	68	.....	...	54	25.5	4
24	123.5	22.2	95	105	117	*141*	119	4.8	71.5	114	106	52.4	23.8	3
128	120	22	101.6	111	114	*139*	122	0	73	111	103	50.8	25.4	4
.....	.....	....	90.5	103.2	133	.....	.....	....	....	.....	...	....	....	.

	BASION-ALEV. PT. LENGTH	NOSE LENGTH	NOSE WIDTH	ORBITS WIDTH	ORBITS HEIGHT	U. JAW ALVEOLAR LENGTH	U. JAW ALVEOLAR WIDTH	L. JAW WIDTH ACROSS CONDYLES	HEAD WIDTH-LENGTH	HEAD HEIGHT-LENGTH	HEAD NASAL	INDICES FACIAL WITH L. JAW—ACTUAL	INDICES FACIAL WITH L. JAW & TOOTH WEAR	INDICES FACIAL WITHOUT L. JAW	INDICES ORBITAL	INDICES GNATHIC
	98	52.4	28.6	38	31.7	57.5	67	121	80.1	77.2	54.5	80	84.4	49	83.1	100
	97	46.2	23.8	37	31.9	*53*	61.1	122	83.1	78.5	51.5	80.3	80.3	45.4	86.2	93.2
	98	55	28.5	39.7	34.9	57	*64*	112.7	80.5	*76.8*	51.8	80.6	82.5	47.3	87.9	91.1
	110	54	28	42.9	31.7	....	66.7	117.5	*81.4*	83.1	*51.8*	85.4	....	*48.9*	73.8	*100*
	94	47.6	25.4	41.3	34.9	....	....	*117.5*	78.7	81.4	53.3	95.5	....	46.2	84.5	93
..	...	39.5	22.5	36.5	31.7	44.5	57.2	.....	83.9	....	56.9	.....	....	50.4	86.8	.....
.5	92	52.4	25.4	38.5	33.5	52.4	66.7	*118*	*81.6*	*80.4*	48.4	86.3	86.3	51.7	87	90.6
..	...	52.4	27.5	*41.3*	35	*56*	66.7	.....	*80.3*	....	52.4	.....	....	....	*84.7*	.....
	100	54.5	27	42.9	*40*	54	60	.....	86.1	83.8	49.5	.....	....	49.3	93.2	90.9
..	...	44	25.2	38	33	54	62	.....	*81.2*	....	*50.7*	.....	....	50	86.8	.....
	102	52.4	25.4	39.6	34.5	*54*	69	120	86.1	80	48.4	85.9	....	48.1	87.1	99
..	...	52	29	*41*	*35*	*58*	66.7	.....	*77.5*	*83.7*	55.7	93	....	56.4	*85.3*	.....
..	...	....	....	*36.5*	*35*	51	*62*	120	*71.2*	*75.8*	*47*	*99.2*	....	*56.2*	95.8	.....
..	...	52.4	25.4	*41.5*	33.3	....	....	124	*75.2*	*78.5*	48.4	*91.8*	*91.8*	*50*	*80.2*	.....
	...	....	....	....	....	....	....	128.5	75.1	*74*	....	.....	....	....	.....	.....
	95	54	27	42.9	36.5	....	66.3	129	*91.4*	*78.9*	50	84.6	....	.....	*85*	95.2
	99	56.3	26.3	41.5	36.5	56	70	136	86.7	80	46.7	84.3	84.3	51.7	87.9	99
	105	49.5	25.3	38.1	31.7	....	64	104	79	....	51.1	94.9	....	57.6	83.2	108
	97	49.2	25.1	38.1	33.3	....	60	111	80.2	*77.8*	51	92.8	....	43.2	88.7	92.3
	100	47.6	22.2	*38.2*	....	52.4	62	119	90.9	78.7	46.6	*80*	....	48.1	.....	98
	87	56	27.5	41.3	35	53	65	122	85.2	82.9	51.8	93.2	93.2	52.6	84.7	94.5
	95	57	25.5	41.3	33.6	*54*	68	117	90.7	83.6	53.1	89.7	....	53.4	81.3	105
..	...	55.6	25	39.7	36.5	....	69	121	*81.2*	*80.1*	....	.....	....	....	.....	.....
..	...	52	26	38	33.3	54	63	125	80	*76.2*	50	91.4	93.4	52.2	87.6	.....
	...	....	....	....	....	....	....	.....	84.8	76.7	....	.....	....	....	.....	.....
	107	47.6	28	*36.5*	*31.7*	54	*67*	127	*84.3*	*86.1*	58.8	*96.2*	....	57.5	86.8	98.1
..	...	49.2	26.4	40.2	33.1	....	62	114.3	80	....	53.6	.....	....	....	82.3	.....
5	91	*50.8*	25	39.7	32	....	....	125	80.1	82.3	49.2	87.6	....	52.3	80.6	95.7
..	...	50.8	25.4	39.7	35	47.5	63	127	90.5	....	50	*90.6*	....	*54.2*	88.1	.....
0	100	49.2	23.8	38.1	31.7	...	....	119	81	81	48.3	*90*	....	51.1	83.4	*100*
1	...	54	25.4	39.7	37.8	....	64	124	82.9	79.4	47	86.2	86.2	50.7	95.2	.....
0	102	52.7	23	41.3	34	....	....	112.7	80.3	78.4	*43.6*	*87.2*	*92.3*	51.5	82.1	92.7
0	*122*	*56*	*25.4*	43	36.5	56	63.5	130	*76.7*	*80.5*	*45.3*	*85.5*	90	*48.2*	84.8	*94*
..	...	55.6	25	41.3	36.5	....	....	140	*78.4*	*77.6*	45	*89.2*	98	*54.1*	*88.3*	.....
..	...	54	25.5	43	36.5	60	70	*124*	78	83.1	46.7	91	91	53.4	*84.8*	98
3	...	57	26	38.5	34	....	....	127	77.9	79.6	45.6	82.8	90	*49.7*	*88.3*	.....
4	*105*	54	27	41.3	34.5	55.6	66.7	125	74.7	77.4	50	*89.8*	*90*	*51.4*	83.5	*92.1*
7.5	*114*	50	27	41.3	35	50	58.7	127	*77.5*	....	54	*86.3*	90.9	*52.8*	84.7	*97.8*
0	105	52	25.5	41.3	33.3	....	63.5	133	*73.8*	76	49	85.2	89.8	45.2	80.6	95.8
8	*126*	53	30	42.9	33.3	....	....	.....	*73.8*	*75.4*	56.6	*90.3*	*95*	....	*77.6*	.....
4	106	54	*25.2*	41	33.3	55	65	128	*71.8*	*75.6*	*47.2*	87.6	90	*46.9*	81.2	.....
..	...	54	25.5	43	36	57	60.3	130	71	*77.3*	46.7	*89.6*	*89.6*	46.9	83.7	.....
4	106	52.4	23.8	39.7	*35*	51	66.7	130	*72.7*	*78*	45.4	*84.4*	*90.5*	50.7	*88.1*	93
1	103	50.8	25.4	41	35	*51.6*	66.7	125	71.1	78	50	87.6	87.6	*52.5*	85.3	92.7
..	...	....	....	....	....	....	....	.....	*72.3*	76.9	....	.....	....	....	.....	.....

that the bodies had simply been laid down and covered with earth and stones taken from the gravel. The double burial EM 115–116 was of this type. EM 117 which had disturbed it showed a dug grave up to near the Black Seam. In the Big West Mound, WM 49 and 25 appeared to have been laid down upon the Ash Layer with dirt and stones heaped over them. WM 38 and WM 67 were in graves dug through the Black Seam. The element of speculation in this discussion increases when we move outward from EM 83, 100, 101, 102 and WM 67 to the rim burials EM 115, 116, WM49, etc., where marks of stratification were absent or uncertain.

My helper, Albert Tennik, and I are now engaged in exploring the "lodge-pits" encircling the mounds and it was my intention to refer briefly in this addendum to such facts as might be disclosed, showing what relationship if any the pits might have to the mounds. However, it now appears that the pits contain too much of interest to be so summarily disposed of and further account of them is deferred. Our preliminary examinations indicate that the pits were dwellings. They abound with camp refuse. As there are 43 ranging from 20 to 40 feet in diameter the field for exploration is a wide one. Relics thus far unearthed are all pre-European.

Skull Measurements and Bone Measurements

Skulls

Measurements are in millimeters.

Where measurements have one dash under them (—) this means that the specimens because of distortion may not be absolutely accurate. Two dashes (=) signify more doubt and three dashes (≡) considerable doubt although all of the figures may be safely used to determine types.

All skulls are not sufficiently mended to get all measurements, and there are 15 or more skulls not listed which must yet be mended. There are also about 25 young skulls not mended.

One list headed by WM 38 is accurate stratigraphically in more or less descending order. The second list headed by EM 78 is a bit uncertain stratigraphically.

Bones

Measurements are in millimeters.

All length measurements are the greatest length except femur and tibia. The former shows the bicondylar length, the latter without spine. There are large numbers of bones not yet cleaned and mended.

Note. It will be noticed that measurements of the frontal bone give good indication of whether the skull is a long meso, or round head. Taking the greatest width in proportion to the length—straight line, nasion to bregma, long skulls show greater length than width in the frontal bone, while round or broad skulls show considerably greater width than length.

A COMPARISON OF MENTAL ABILITIES OF NOMADIC AND SEDENTARY INDIANS ON A BASIS OF EDUCATION

By THOMAS R. GARTH

IN AN article by the writer entitled, "The Comparison of the Mental Abilities of Mixed and Full Blood Indians on a Basis of Education,"[1] he showed that the mixed-blood performance was eleven per cent better on the average than that of the full-blood Indian performance. The full-blood Indians reported on were of Plains and Southeastern tribes. And since they were of ancestry of nomadic habits roving over the plains and through the southeastern forests, we have conceived the problem of comparing these individuals of so-called nomadic habits with pure-blood Indians of an ancestry of decidedly sedentary habits.[2] These are the Pueblo, Zuñi and Hopi Indians, who for generations have by crude agricultural methods wrested their livelihood from the soil. Of the Plains and Southeastern Indians, our "nomadic" group, there were two hundred and fifteen full-bloods, while of the Southwestern or Plateau Indian group, our "sedentary" group, there were two hundred forty-three full-bloods. We have no device for determining whether or not these were really full-bloods, but we have taken the statements of the Indians themselves, which is accepted by the government of the United States.

Table I[3] which gives the educational composition of the two groups[4] shows that the factor of education was kept balanced in

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[1] Psychol. Review, vol. 29, no. 3, 221–236.

[2] The data for the sedentary tribes was secured on an expedition to the Indians made possible by courtesy of the Grants Committee of the American Association for the Advancement of Science in the spring of 1921.

[3] The writer acknowledges the assistance of his graduate students in scoring papers for data used in this report, particularly Misses Florence M. Mercer, Helen G. Mercer, and Irma Gesche at University of Texas.

[4] The experimenter is under obligations to Professor A. L. Kroeber of the University of California, and Professor J. E. Pearce of the University of Texas for assistance in classifying the Indians as nomadic and sedentary.

all group comparisons for there were just about the same number from any school grade in both groups. Because, however, of the small total number of cases it was necessary to combine fourth and fifth grades, sixth and seventh grades, and eighth, ninth and tenth grade subjects each respectively into a sub-group. This makes three educational sub-groups, I, II, and III.

TABLE I

COMPOSITION OF SUB-GROUPS

Sedentary	Number of cases	Total
Sub-group I		
4th Grade	43	
5th Grade	46	89
Sub-group II		
6th Grade	72	
7th Grade	43	115
Sub-group III		
8th Grade	20	
9th Grade	14	
10th Grade	5	39
Grand Total		243
Nomadic		
Sub-group I		
4th Grade	37	
5th Grade	57	94
Sub-group II		
6th Grade	49	
7th Grade	31	80
Sub-group III		
8th Grade	17	
9th Grade	17	
10th Grade	7	41
Grand Total		215

In order to make this comparison of the mental abilities of the two classes of Indians we have not used the intelligence tests, but have deliberately reverted to the use of group psychological tests of accepted value, such as those used by Pyle and his students on Whites, Negroes, and Chinese,[5] and by Pintner in his mental

[5] Pyle, W. H. The Examination of School Children, Macmillan, N. Y., 1913; *id.*, The Mind of the Negro Child, (School and Soc. 1915, vol. I, pp. 357-360); *id.*, A Study of the Mental and Physical Characteristics of the Chinese. (School and Soc., 1918, 8, 264–269.)

survey work.[6] There were eight of these tests: as three controlled association tests, the opposites test, the genus-species test, and the part-whole test; the free association (continuous); three memory tests, logical memory, and rote memory concrete, and rote memory abstract; and one word-building or ingenuity test, called in the psychological laboratory the "aeirlp" test.

Table II gives the average and median scores for the nomadic and sedentary Indians in their educational sub-groups for each test. It also shows measures of variability and per cent obtained

TABLE II

OPPOSITE SCORES

Nomadic	Grades		
	4-5	6-7	8-9-10
No.	96	83	40
Ave.	6.7	9.7	13.5
A.D.	3.0	2.9	3.0
P.E.	2.5	2.5	2.5
Med.	6.4	9.5	14.1
Range	0-7	1-16	3-19
Sedentary			
No.	89	115	39
Ave.	5.5	9.08	10.03
A.D.	1.2	1.3	3.5
P.E.	1.01	1.1	2.95
Med.	5.1	8.6	9.3
Range	0-12	0-16	0-19

GENUS-SPECIES TEST SCORES

Nomadic			
No.	114	85	38
Ave.	7.1	9.5	13.2
A.D.	2.0	2.2	3.5
P.E.	1.7	1.9	3.1
Med.	6.1	8.9	12.7
Range	0-18	1-19	4-20
Sedentary			
No.	128	103	43
Ave.	2.8	6.6	10.5
A.D.	2.2	3.0	4.3
P.E.	1.9	2.5	3.6
Med.	1.3	5.5	11.7
Range	0-13	0-15	0-20

[6] Pintner, Rudolph. The Mental Survey, Appleton, N. Y., 1918.

PART-WHOLE TEST

Nomadic	4 Grades		
	4–5	6–7	8–9–10
No.	85	77	39
Ave.	5.1	8.4	10.3
A.D.	.1	2.9	2.5
P.E.	.1	2.5	2.1
Med.	4.9	8.1	10.1
Range	0–13	2–20	2–19
Sedentary			
No.	129	102	43
Ave.	3.6	6.6	8.5
A.D.	2.5	2.5	2.2
P.E.	2.1	2.1	1.9
Med.	2.6	6.6	8.6
Range	0–10	0–11	2–14

FREE ASSOCIATION

Nomadic			
No.	105	81	38
Ave.	39	44.2	53.3
A.D.	12.3	8.7	8.0
P.E.	10.3	7.2	6.7
Med.	40	45.3	5.1
Range	0–75	5–68	39–74
Sedentary			
No.	120	101	38
Ave.	24.7	39.2	48.1
A.D.	10.7	10.4	13.2
P.E.	9.04	8.8	11.2
Med.	22.5	39.3	48
Range	2–62	4–70	10–74

LOGICAL MEMORY

Nomadic	Grades		
	4–5	6–7	8–9–10
No.	92	81	37
Ave.	14.7	25.6	28.2
A.D.	9.7	9.9	10
P.E.	8.2	8.3	8.5
Med.	12.8	26.0	29.5
Range	0–36	4–46	8–51
Sedentary			
No.	103	106	42
Ave.	9.8	24.12	32.4
A.D.	5.7	7.4	8.3
P.E.	4.8	6.2	7.01
Med.	8.14	23	34
Range	0–29	0–48	10–54

ROTE MEMORY-CONCRETE

Nomadic			
No.	106	83	38
Ave.	37.5	39.9	43.1
A.D.	4.8	4.3	2.3
P.E.	3.9	3.6	1.9
Med.	37.6	39.3	41.3
Range	22–58	26–54	32–56
Sedentary			
No.	117	88	42
Ave.	29.4	35.5	38.2
A.D.	5.9	6.09	6.1
P.E.	4.9	5.1	5.2
Med.	31.3	34.8	38.5
Range	1–47	12–50	23–51

ROTE MEMORY-ABSTRACT

	Grades		
Nomadic	4–5	6–7	8–9–10
No.	106	83	38
Ave.	27.1	32.2	38.8
A.D.	6.6	5.3	4.3
P.E.	5.6	4.4	3.5
Med.	25.9	31.8	38.5
Range	6–51	17–47	24–51
Sedentary			
No.	117	88	42
Ave.	21.8	26.4	34.4
A.D.	5.4	3.3	5.2
P.E.	4.5	2.8	4.4
Med.	21.6	28.3	33.9
Range	3–39	1–47	21–46

WORD-BUILDING "AEIRLP"

Nomadic			
No.	101	80	35
Ave.	10.1	12.9	15.9
A.D.	4.0	3.5	7.1
P.E.	3.3	2.9	6.1
Med.	9.5	13.0	14.5
Range	0–21	0–22	0–22
Sedentary			
No.	98	105	39
Ave.	4.6	7.2	10.2
A.D.	2.5	4.9	5.4
P.E.	2.1	4.1	4.6
Med.	4.9	7.3	10
Range	0–15	0–18	0–24

upon dividing the average scores of the sedentary sub-groups by those of the corresponding nomadic sub-group. Thus, the average score of the nomads in the fourth-fifth sub-group in the opposites test is 6.7, and that of the sedentary Indians for the corresponding educational sub-group is 5.5. The ratio of nomad score to sedentary score is then 121. (See Table III.) In the same test for the next higher educational sub-group, the sixth-seventh grade, this ratio is 106, and for the most advanced educational of sub-groups this is 134. In the genus-species test, (again in Table III), the ratios of sedentary average score to nomad average score read: 253 for fourth-fifth grades, 143 for sixth-seventh grades, and 125 for eighth-ninth-tenth grades. Table III gives the average ratio

TABLE III

(Showing Per cent Obtained by Dividing Nomadic Average Score by Sedentary Average Score.)

Test	Sub-Group 4–5	Sub-Group 6–7	Sub-Group 8–9–10	Total	Ave.	Rank
(1) Opposites	121	106	134	361	120.3	4
(2) Genus-Species	253	143	125	521	173.6	7
(3) Part-Whole	141	127	121	389	129.6	6
(4) Free Association	157	112	110	379	126.3	5
(5) Logical Memory	150	106	87	343	114.3	1
(6) Rote Memory, Con.	127	112	112	351	117	2
(7) Rote Memory, Abs.	213	121	112	356	118.6	3
(8) Word Building	219	179	155	553	184.3	8
(9) Average Per cent	161.3	125.7	119.5		135.5	

for the sub-groups for each test in column (5) and the average ratio for a sub-group in all tests and the average of the facts of column (5) in row (9). Table III also gives the rank, column (6), of the total averages of column (5). It will be seen that on the whole the nomads, grade for grade, excel the sedentary Indians in all these tests of higher mental process, and that the average ratio is 135, or that the former are 35.5 per cent better than the latter on the whole.

The question now arises as to whether or not these differences as indicated are real. This may be determined by ascertaining the per cent of overlapping of one distribution on another, or finding out what per cent of one series of measures, as that of

sedentary Indians, attain and exceed the median of the nomadic subjects for a sub-group for a test. These facts are given in Table IV. These measures of overlapping range from that of 5 per cent as found in sixth-seventh grade sub-group for the Word Building Test to 61 per cent in the Logical Memory Test for the eighth-ninth-tenth grade sub-group. The averages of the overlapping for the respective sub-groups are 27 per cent, 34 per cent, and 37 per cent. On the whole the differences tend to be real differences as thus determined, but they are greatest in the fourth-fifth grade sub-group and least in the most highly educated sub-groups and they are in the same direction, in favor of the nomads, with the

TABLE IV

(Showing Overlapping—Per cent of Sedentary Scores that Attain and Exceed Median of Nomadic Scores.)

	Grades		
	4–5	6–7	8–9–10
Opposites	47	52	20
Genus-Species	18	31	49
Part-Whole	37	42	39
Free Association	12	30	27
Logical Memory	38	43	61
Rote Memory-Concrete	18	36	38
Rote Memory-Abstract	34	33	32
Word Building	15	5	30
Average	27	34	37
Median	26	34	35

exception of the eighth-ninth-tenth Logical Memory Test when the sedentaries excel the nomads.

In conclusion then, we may say that:

1. In tests of higher mental process, the Indians of nomadic ancestry are on the average 35 per cent better than those of sedentary ancestry.

2. They are more nearly alike in their performance of memory tests, being more alike in this respect in Logical Memory than in Rote Memory for Abstract words.

3. They are least alike in their performance of the ingenuity test, which of all the tests, requires possibly the most thinking.

4. The differences grow less as the two larger comparative groups can show more education, or education reduces the differ-

ences in the test performance between the nomadic and sedentary Indians, but never less than about 20 per cent in favor of the nomadics.

5. The reader will note the great amount of variability in measures as indicated by the range as given for each test. For instance in the fourth-fifth grade sub-group in the Rote Memory Test-Concrete see where the Nomadic lowest score was twenty-two and the highest fifty-eight, while in the case of the Sedentary Indians the lowest score was one and the highest forty-seven. Just the range of lowest score to highest indicates the superiority of the Nomads in this test. See also an illustration in the case of Rote Memory-Abstract where the Nomadic lowest score was six and highest was fifty-one and the Sedentary score was for lowest three and highest thirty-nine. But these are rather vague measures of a difference.

6. For purposes of direct comparison we cannot rely on such method as that indicated above, but we must have some representative measure which may be consistently used and for that reason we have resorted to using the average as a representative measure when it comes to getting the relative performences expressed as ratios. This makes it possible to say that on the average the Nomadic performance is 35 per cent better than that of the Sedentary performance.

7. Again if one questions the value of averages and their comparison as showing real differences we may put the data to the crucial test of finding how many Sedentary Indians attained and exceeded the median performance of the Nomadics. This will produce the more conclusive result. We find this in the overlapping. By this method we can say that on the average only 32.7 per cent of the Sedentary subjects did even as well as the median Nomadic subject or better than that. That is to say, 67.3 per cent, on the average, of the Sedentary subjects fell below the Nomadic median performance.

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SOUTHERN MAIDU RELIGIOUS CEREMONIES

By EDWARD WINSLOW GIFFORD

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Introduction

IN CALIFORNIA there were four cult religions which have been designated by Professor A. L. Kroeber as the New Year cult, the Kuksu or God-impersonating cult, the Jimsonweed cult, and the Dream cult. These four cults had their strongholds respectively in northwestern California, in central California, in the western part of southern California, and on the Colorado river. It is the God-impersonating or Kuksu cult with which this paper is concerned.

As the name "god-impersonating" implies, the central Californian cult was one in which the participants in the most important ceremonies impersonated spirits and deities. No actual masks were worn, but by means of paint, feathers, ornaments,

and grass veils, the participants disguised themselves so as to be unrecognizable in many cases.

The hotbed of this system of god-impersonation is placed by Kroeber among the Patwin[1] of the lower Sacramento valley. The distinctive traits of the cult system are regarded by Kroeber as the presence of a male secret society, the use of disguise, and the use of a large earth-covered house together with a log foot-drum. Although the earth-covered house occurred as a dwelling alone among some groups adjoining the area in which the Kuksu cult was practiced, its use as a ritualistic chamber seems to coincide with the Kuksu cult rather closely. The foot-drum was used only so far as known by tribes that practised the rites of the god-impersonating Kuksu cult.

To date the fullest published knowledge on the Kuksu cult concerns the Northwestern Maidu,[2] the Patwin,[3] and the Pomo.[4]

Kroeber considers that the Patwin have the cult in its most elaborate form and that the Pomo and Yuki form a sub-unit as against the Patwin and Northwestern Maidu, the latter having borrowed many of their ceremonies from the Patwin.

> The Miwok of whom we have information, and apparently the Costanoan and Salinan stocks, seem to have participated rather in the Pomo than in the Patwin form of the ritual.[5]
>
> The inference is that the valley Patwin and Maidu, although centrally located with reference to the distribution of the whole dance system, possessed it in an aberrant form, and that the border tribes, which customarily evince cultural traits in their most pared-down condition, are in this case the more representative. This can mean only one thing. The Maidu and Patwin once shared the generalized or Pomo-Yuki-Miwok form of the cult, perhaps even originated it. Either because of this earlier start, however, or because of a

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[1] A. L. Kroeber. Handbook of the Indians of California, B.A.E., Bull. 78, 364, 1925.

[2] Roland B. Dixon. The Northern Maidu, Bull. A.M.N.H., XVII, 283–333, 1905.

[3] A. L. Kroeber. Handbook, chapter 26.

[4] S. A. Barrett. Ceremonies of the Pomo Indians, Univ. Calif. Publ. Am. Arch. Ethn., XII, 397–441, 1917. Edwin M. Loeb. Pomo Folkways, Univ. Calif. Publ. A. A. E., XIX, 149–405, 1926.

[5] Kroeber. Handbook, 381.

more rapid progression, they developed the generalized form of the system to its limits and then passed beyond it to their own peculiar *Hesi-Moki* form, leaving the outer tribes, such as the Pomo and Miwok, adhering to the older rites, and the extreme marginal Yuki perhaps attaining only to the rudiments even of these. There is thus a ritual superimposed upon a ritual in this cult, a *Hesi* system laid upon an older *Kuksu* system. This crown attained in the *Hesi* belongs only to the Patwin and Maidu, and it almost certainly is a Patwin product; that the generic *Kuksu* basis also had its origin among the Patwin, at least largely, is therefore a reasonable possibility.[6]

This central Californian God-impersonating cult has been called synonymously the Kuksu cult because of the connection with it of a personage or deity called Kuksu. Among the Pomo he is the god of the south, among the Northwestern Maidu he was the first man, among the Miwok he is a sylvan spirit. However, among this last people the concept may have been introduced within the last sixty years. Among the Patwin and Northwestern Maidu the Kuksu impersonator did not dance or form the central figure of a ceremony. Among the Pomo, Costanoan, Salinan, and Sierra Miwok there were Kuksu ceremonies. This is one of the features that Kroeber contrasts, in the paragraph quoted just above, with the Hesi-Moki form of the cult which seems to have been the crowning development among the Patwin and Northwestern Maidu. In this paper I shall call this highly elaborated Patwin form of the cult the Hesi form, that among the Pomo and other groups the Non-Hesi.

It was for the purpose of determining the ceremonial relations of the Southern Maidu that the writer visited them for a brief period. The material obtained was far from voluminous, but is sufficient to reveal roughly the relation of the ceremonialism of the Southern Maidu to that of their northwestern congeners and their other central Californian neighbors, the Patwin and Miwok. The information obtained concerns the southernmost Southern Maidu. These include both valley dwellers and hill dwellers, a point which should be borne in mind, since the hill dwellers along the whole length of the Sierra Nevada seem to have attained far less complexity in ceremonialism than the valley dwellers.

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[6] Kroeber. Handbook, 381.

The data gathered throw additional light upon what we may call the two elaborate developments of the Kuksu cult, which, as stated above, I shall call for convenience the Hesi and Non-Hesi forms. The Southern Maidu data also indicate the presence of ceremonies antedating in that region the two forms of the Kuksu cult just mentioned. The direction in which the ceremonial influences traveled is also indicated, two waves having reached the Southern Maidu, one from the north, the other from the south. The southern wave apparently had behind it the stimulus of the Ghost Dance movement of 1872; in fact, it may be regarded as a manifestation of that movement, in which the old dances of Non-Hesi form of the Kuksu religion were revived and adapted to the aims of the messianic Ghost Dance religion, then taught to groups which hitherto were unfamiliar with the dances, although probably already possessing a simple form of the Kuksu Cult system. Thus, in south central California, the revival stimulated by the Ghost Dance movement paralleled that in north central California. The Southern Maidu data also throw some light on the questions of initiation, of the relation of the chief to the cult, and of the relation of the shaman to the cult. The whole situation, however, is complicated by the presence of apparently three strata of ceremonies which may be spoken of as indigenous, northern, and southern (Ghost Dance influence). The use of the term indigenous does not imply that the ceremonies necessarily arose upon the spot. It merely means that so far as our knowledge goes we have no record of their having been introduced from elsewhere, as in the case of the northern and southern introductions.

The time spent among the Southern Maidu was so brief that descriptions of the dances were not obtained in any detail. In fact, the object of the visit was to work out the general relationships of the Southern Maidu ceremonies rather than to get full details as to their actual enactment. Such data as were gathered, although quite fragmentary in character, are presented under appropriate headings in the following pages. No data were recorded concerning the funeral and mourning ceremonies of the Southern Maidu.

With the Washo, the eastern neighbors of the Southern Maidu, relations seem to have been hostile, for informants said the Washo were always wanting to fight and used to cross the mountains and kill Maidu. With their other central Californian neighbors, the Miwok on the south, the Patwin on the west, and other Maidu on the north, the Southern Maidu seem to have been on friendly

Linguistic groups (names underscored) and modern towns.

terms, and it was these neighbors that seem to have exerted a profound influence on Southern Maidu ceremonialism.

In this paper the Southern Maidu who come particularly under consideration are those dwelling in the region south of a line drawn from Colfax through Auburn to Sacramento. Auburn and Colfax are in the hills and lower mountains. Folsom, referred to in the

paper, is in the lower foothills near their junction with the plains; so also are Michigan Bar and Ione. Ione is in Northern Miwok territory. Plymouth and Forest Home are in the foothills. The following places referred to are also in the hills and are on the line of the railroad from Sacramento to Placerville. In ascending order they are: Latrobe, Brela, Dugan, Shingle Springs, and Camino.

To further locate these various spots I shall mention them by counties. Colfax and Auburn are both in Placer county. Folsom and Michigan Bar are at the eastern edge of Sacramento county. The Maidu village of Goduma, near Sacramento is near the western edge of the county and the only place referred to in this paper which is well out in the plains. Plymouth, Forest Home, and Ione are all in Amador county. In the Sierra Nevada region, culture, as a rule, grows simpler as one climbs higher. It grows more complex as one descends into the Sacramento and San Joaquin valleys, so that in the present paper Colfax and Camino represent the people who lived at the highest altitude and who had the simpler culture. Auburn and the region of Shingle Springs, Dugan, Brela, and Latrobe would represent an intermediate situation, lower in the hills and with a culture probably somewhat more complex than that of the mountain dwellers. Folsom, Michigan Bar, and Ione are near the border of foothill and valley and approach more closely the high culture of the delta region of the Sacramento and San Joaquin rivers. It is these places which seem to have been the first to receive the new ceremonial features of the southern (presumably Ghost Dance) stratum introduced from Pleasanton in Alameda county.

The data were recorded by the author in 1918 and 1923, with the exception of the few statements attributed to Miss Anna H. Gayton, which she recorded in the summer of 1925 from the lips of Tom Cleanso, a man of about 65 years of age, born at Goduma village, near Sacramenta, California. All data were recorded for the University of California Department of Anthropology and are published with the permission of that institution.

The informants interviewed by the author in 1918 were Hattie Thomas of Camino, El Dorado county; Jesse D., born at Latrobe, El Dorado county, but married to a Camino woman and residing there; George Smith, fifty-eight years old, and his wife, of Shingle Springs, El Dorado county; Jim Dick, fifty-two years old, born at Coal Station, El Dorado county, and later resident of Auburn, Placer county; Henry Charlton, born in 1863 at Pokerville, near Plymouth, Amador county; William Joseph, perhaps fifty-five, born near Plymouth. The only informant interviewed in 1923 was Henry Charlton.

The Three Strata of Southern Maidu Dances

Southern Maidu dances seem to fall into three strata. Last and most recent are dances introduced apparently about 1872 by a teacher named Yoktco, whose home was near Pleasanton in Alameda county, where he resided in a mixed settlement of indigenous Costanoans and transplanted Northern San Joaquin Yokuts and Plains Miwok. This mixed assemblage represented the last of the Indians and their descendants once collected at Mission San Jose in Alameda county. Yoktco's language was Plains Miwok, but the ceremonies which he introduced among the Southern Maidu were not necessarily true Plains Miwok ceremonies, as the habitat of that people is the plains region lying largely east of a line drawn from Sacramento to Stockton. So the mere fact that Yoktco spoke Plains Miwok should not be taken as evidence that he necessarily introduced native Plains Miwok ceremonies among the Southern Maidu. On the contrary, the ceremonies which he introduced were said to have been those in vogue at Pleasanton[7] in Alameda county, many miles removed from the Plains Miwok habitat. Yoktco's introductions among the Southern Maidu were spoken of by informants as "dances from the south," and as already stated they are doubtless to be regarded as ancient dances which were revived and made over through the stimulus of the Ghost Dance movement of the seventies. The dances which he introduced were the following: *hiweyi, kilaki, kuksui, lole, mamas, ta, tula, yomuse.* Two of these dances, *lole* and *yomuse*, were reputed to have had an earlier introduction among the Southern Maidu, having first appeared from the north. How much time intervened between their introduction from the north and their introduction from the south by Yoktco I cannot say. With the exception of *yomuse* and *ta* these dances introduced by Yoktco appear to have been introduced also among the Northern and Central Miwok, probably about the same time, by two other teachers named respectively, Sigelizu and Tciplitcu, so that their appearance among Southern Maidu and Sierra

[7] From Pleasanton informants, in 1914, it was learned that *kuksui, lole,* and *hiweyi* (described as a shamans' dance for curing) were among the dances formerly practised there.

Miwok would appear to be part of a great missionary movement which presumably emanated from the Pleasanton region about 1872 and constituted the south central Californian manifestation of the messianic Ghost Dance religion. The various features that characterize this latest stratum of ceremonies will be considered later. That this stratum should be identified with the Ghost Dance movement of the early seventies there seems good reason to believe, and there is probably ample justification for equating it in a general way to the Patwin *boli* and the Pomo *maru* dances, as the modern Ghost Dance performances are designated by those two peoples. Like them, it consists of dances of the old Kuksu Religion that have been reinvigorated, remodeled, and adapted to the teachings of the messianic Ghost Dance Religion.[8]

A second and earlier stratum of dances is said to have come to the Southern Maidu from the north. It comprised the dances called *dape*, *kamin*, *lole*, *luhuyi*, *wulu*, *om wulu*, and *yomuse*. *Lole* and *yomuse* we have just referred to as having been introduced also at a later time, from the south. Whether the two forms of these dances, northern and southern, were identical I cannot say. With the dances thus attributed to a northern origin the name of no teacher is associated. That the introduction of these dances probably antedates considerably the introduction of the dances from the south by Yoktco seem probable, for in the early seventies Stephen Powers[9] found the dances *kamin*, *yomuse*, and *lole* being practiced in the Bear River region, which lies in the northern part of the Southern Maidu area. Powers' account gives no hint that they were recent introductions; but, on the contrary, gives the impression that they were old established ceremonies.

The dances which I have just enumerated as constituting the second stratum of Southern Maidu dances, that which came from the north, would seem to belong to the God-impersonating Cult system. Two of them, in fact, *lole* and *luhuyi*, are listed by Dixon[10] and Kroeber[11] as among the common and less sacred dances of

[8] Kroeber gives a lucid account and map of the spread of the Ghost Dance Religion in northern California. Handbook, 375, 376, 868–873.

[9] Tribes of California, Contributions to North American Ethnology, III, 324, 1877.

[10] *Op. cit.*, 290, 291.

[11] Handbook, 435.

that cult among the Northwestern Maidu. The *dape* dance, in which the spirit or animal impersonated was coyote, has an analogue among the Northwestern Maidu in the *oleli* dance which is one in which a single spirit impersonator appears.[12] Moreover, *dape* is the term for clown, an actor who seems to have been well established among the Southern Maidu, who identify him with coyote which the Northwestern Maidu do not. All of these dances among the Southern Maidu with whom I am acquainted take place in the ceremonial dance house or earth-covered lodge, which would seem to indicate that they are unquestionably of the generic type which we are calling Kuksu or God-impersonating, although they probably belong to that particular sub-class designated as common dances, inasmuch as the spirits impersonated, if any, are of scant importance.

The third and lowest stratum of Southern Maidu dances which I have spoken of as indigenous dances, since it seems impossible to attribute them to introduction from elsewhere, are the *bu* or skunk dance (perhaps to be identified with the disputed *weyo* dance of the Northwestern Maidu),[13] the *lumenwo* dance, the *weda* dance, the *wetem* dance, and the *yohohanup* dance. The *weda* dance, which is described by Dixon for the Northeastern Maidu[14] and by Powers[15] for the Southern Maidu of the Bear River region, was held out-of-doors and should undoubtedly be excluded from the category of God-impersonating, as the descriptions of it give no implication of such a motive. In the *bu* and *lumenwo* dances, the skunk and presumably the creeper are represented. If the *lumenwo* truly represents the creeper, a small bird which runs spirally up and down the trunks of trees in search of food, then it is probably to be equated to the Northwestern Maidu *tsamyempi* dance and the Central Miwok *akantoto* dance. It seems proper to regard both the *bu* and *lumenwo* therefore as belonging to the God-impersonating Cult system. I have no evidence to indicate whether the *wetem* and *yohohanup* dances were held within the earth-

[12] Kroeber. Handbook, pp. 434, 435.
[13] Kroeber. Handbook, 436.
[14] *Op. cit.*, 318.
[15] *Op. cit.*, 324.

covered dance house or out-of-doors, but presume the former to have been the case. The use of the whistle and cocoon rattle in the *yohohanup* dance suggests that it was practised indoors. The *wetem* dance was also called the "war dance", because the dancers carried bows and arrows.

If the attribution of the above dances to the indigenous or earliest stratum is correct, it seems likely that we may include them, with the exception of the *weda*, in the God-impersonating Cult system. On the other hand, if the attribution of these dances to this stratum, with the exception of the *weda*, is wrong, then we are justified in saying that the God-impersonating Cult is relatively recent in appearance among the Southern Maidu. However, I see no reason for thus discounting the evidence and feel that it would be gratuitous to deliberately deny the truth of this particular evidence and assume the truth of other evidence from the same sources. It, therefore, seems to me justifiable to regard the earliest stratum of Southern Maidu dances, with the exception of the *weda*, as constituting the simplest and least elaborate form of the God-impersonating Cult system with which we are acquainted. Lying, as the Southern Maidu do, upon the eastern periphery of the area in which the God-impersonating cult is practiced, it is probably proper to regard this lowest stratum of dances as perhaps representing the type of simple dances from which the elaborate ceremonies of the Patwin and Northwestern Maidu have been evolved. That they are the direct ancestors of the elaborate ceremonies of the Patwin and Northwestern Maidu I do not for a minute believe, but I do think that they give us some conception of the simple type from which these complex ceremonies have probably been elaborated. In this respect their relation to the highly elaborated ceremonies of their neighbors parallels in a general way the relation of the simple ceremonies of the Yuki, coast Pomo, and Coast Miwok to the elaborate ceremonies of the inland Pomo. In other words, the Southern Maidu, so far as their earlier dances are concerned, and the coast Pomo, Yuki, and Coast Miwok are on the margins of the area of the God-impersonating cult and presumably show early forms of that cult; forms, however, which are far from identical, for the Southern Maidu seem to have represented only

minor spirits and animals in their earliest ceremonies, whereas the Yuki and coast Pomo represented the creator and the god Kuksu.

In the following discussion of Southern Maidu data I shall begin with that which pertains to the third and latest stratum of dances, which was introduced by Yoktco, since it is concerning this that the memory of informants is freshest and the information consequently fullest. From this I shall work back to the less known introductions from the north and the indigenous or earliest stratum of dances.

DANCES FROM THE SOUTH

As already explained, these dances, which should doubtless be connected with the Ghost Dance cult (Pomo *maru* and Patwin *boli*), were introduced apparently about 1872 by an Indian named Yoktco. They consisted of the following dances: *hiweyi*, *kilaki*, *kuksui*, *lole*, *mamas*, *ta*, *tula*, and *yomuse*. With the exception of the *ta* and *yomuse* dances, these are all dances which are quite widespread, their names being largely characteristic of the Non-Hesi (Pomo) form of the God-impersonating cult. I rather suspect that the *ta* and *yomuse* dances really belong to the earliest and middle strata of Southern Maidu dances, since the names are not found in other groups. Of the several dances introduced from the south, *hiweyi*, *kilaki*, *kuksui*, and *lole*, are found among the Pomo. None of these dances, however, with the exception of the *lole*, occur among the Northwestern Maidu, and none, with the exception of the *lole* and *kilaki*, among the Patwin. The affiliation is therefore plainly with the Pomo and Miwok rather than with the Patwin and Northwestern Maidu. Needless to say, this affiliation, so far as the Miwok are concerned, is strengthened by the reported southerly origin of these dances.

Connected with these dances of late introduction seems to have been the custom of confining boys and girls in the dance house in order to teach them the songs which were sung as dance accompaniment. That such confinement took place only for the stratum of dances introduced by Yoktco seems likely. At any rate it was definitely ascertained that such confinement took place for the dances introduced by Yoktco, whereas the implication is that there was no confinement for the dances of the two earlier strata,

northern and indigenous. This is suggested by the fact that in the hill country where the dances of the third stratum never became established there was no confinement of boys for dance instruction. There was, however, in early times a confinement of boys in teaching them to become shamans, and also confinement of both boys and girls by the chief for ear-piercing. Songs were learned on this latter occasion, but no dances. It seems likely that these customs of confining in the dance house offered a foothold for the confinement in connection with the teaching of the new cycle of dances introduced by Yoktco. A sidelight on this matter is revealed by the case of the Central Miwok, who neither confine boys in connection with shamanistic instruction nor in connection with the learning of dances and songs of the latest stratum of dances which was apparently contemporaneous with the group of dances introduced by Yoktco among the Southern Maidu.

Following the death of the missionary Yoktco, apparently about 1874, his work was continued by a blind man named Rice. It was he who confined and instructed certain of the informants whom I interviewed. One informant was confined for eight days in the dance house (*kum*) and there learned all of the songs of the cycle of dances introduced by Yoktco. The informant was about twelve years old at the time and there were many other boys confined with him. They had all been selected by Rice. There were no girls being instructed on this occasion. The novices were allowed plenty of food, but no meat or salt. The informant and his companions on this occasion learnt many songs, but only one dance, the *hiweyi*.

A boy or girl who was learning to dance was called a *teme*, a term which was equated by the informant to the Northwestern Maidu term *yombasi* (preliminary initiate) with which he was familiar. The term *teme* suggests the word *temaya* which was the name applied to the dance manager Yoktco. This is cognate with the Patwin term *temeyu*, the name of a Patwin dance official who wears a long feather cloak and whose business is to prevent the escape of novices from the dance house,[16] and with *temayasu*, a Sierra Miwok impersonation of probable late introduction.

[16] A. L. Kroeber, unpublished notes.

Among the Southern Maidu the boys and girls who were selected for instruction by the *temaya* could not refuse to serve.

Another feature which seems to have marked the introduction of the new dances by Yoktco was that of the dance manager or *temaya*, whose functions, so far as they existed, had apparently previously been in the hands of the chief (*huk*) of each community. The characteristics of the *temaya* or dance manager strongly suggest the influence of the Ghost Dance religion of 1872. Its effect upon the ceremonial systems of the central Californian tribes is best known in the case of the Pomo and Patwin peoples. One characteristic of the Ghost Dance movement was the rise to power of dreamers or prophets who essayed to predict the future and whose influence largely eclipsed that of the chiefs who had previously been the leaders of the Indian communities. Among the Southern Maidu the *temaya* or dance manager paralleled the Ghost Dance priest (*maru*) among the Pomo to the extent of depending upon his dreams for the regulation of the ceremonial proceedings.

The dreams of the *temaya* Yoktco were of the various spirits who were represented in the several dances. These spirits were said to belong in a class called *nedi*, different from ghosts (*üzwüze* or *us*) and from the human spirits or devils (*gakil*). The *nedi*, however, were human in form and were said to appear as very handsome men wearing the dance ornaments of the particular dance which each represented. Attention should be called to the similarity of the term *nedi* employed by the Southern Maidu for this class of spirits and the term *netdim maidu* or dreamer mentioned by Dixon.[17] Each of the *nedi* spirits which was seen by the *temaya* Yoktco in his dreams was said to be that of a man who died long ago and for whom one dance was named. I have no evidence to show that spirits of this type were associated with the two older strata of dances among the Southern Maidu. As far away as Madera county, among the Southern Miwok, I have encountered the same idea that the dances of late introduction are named for people long dead. This is probably a Ghost Dance conception. In the case of one of the dances introduced by Yoktco,

[17] *Op. cit.*, 271.

the *yomuse*, it is said that the name is that of a woman, long since dead, who was the inventor of the dance. The fact that no spirits were spoken of as connected with the dances of the two earlier strata, with the exception of the *yomuse* just mentioned, seems hardly to warrant the interpretation that there were no spirits, but rather that the older ideas have been swamped by the teachings of Yoktco.

Flourishing alongside the belief that the spirits impersonated in the dances of Yoktco's introduction were spirits of men long since dead and seen only in dreams, is the idea that Kuksu is a nature spirit who may be seen today in the woods and the sight of whom causes bleeding from the nose and mouth.

The dance manager or *temaya* was said to have been appointed by the chief (*huk*). At least such was the case in the lower foothills and in connection with the stratum of dances introduced by Yoktco. In the higher hills there was no *temaya*, the chief managing the dance arrangements himself. Presumably, this applied only to the two earlier strata of dances and not to the third or last stratum, which, however, seems never to have reached the higher hill country, except insofar as dancers from below went up to the hill villages and exhibited their dances.

Other officials in the dances of the third and uppermost stratum were as follows, all being subordinate to the *temaya*.

The drum major in charge of each dance was called *howapbe*. His activities resemble those of our drum majors. He was the Southern Maidu equivalent of the Miwok *sobobbe* and of the Eastern Pomo *xabedima*. The word *howapbe* is formed of the verb *howap* (to raise the hand as a signal to start dancing) and the agentive ending *be*. The *howapbe* was also called the *howap maidu*.

The clown, who is one of the characteristic figures of the God-impersonating cult is called by the Southern Maidu *dape*, which identifies him with Coyote who is also called *dape*. He might appear in any dance of Yoktco's cycle. Other important dance officials are the drummer who is called *dulbe* or *kilembe*, from the words *dul* and *kilem*, which mean drum, and the agentive ending *be*. Alternative terms are *dulbobe*, *dulim maidu*, and *kilemem maidu*. The business of the drummer was to furnish accompani-

ment to the dances by stamping on the great log foot-drum which was always located in the dance house (*kum*). Another important individual was the singer or *solbe*, who was usually accompanied by a chorus. In modern times at least, Northern Miwok and Southern Maidu singers have combined in furnishing the accompaniment for dances of both peoples. Dancers are called either *payobe* or *payuge* from the verb *payok*, to dance.[18]

A tabu similar to one which I have found among the Central Miwok prevailed among the Southern Maidu and certainly was connected with the dances of the latest stratum. This tabu prohibits a dancer eating by himself after a dance under penalty of becoming sick. All dancers must have one meal together after the termination of the ceremonies. Thereafter each may resume his normal eating habits.

It seems quite clear that the Southern Maidu cultural setting for the new dances which were introduced by Yoktco was quite different in certain respects from the Miwok cultural setting. The prominent part played by shamans among the Southern Maidu is one feature which differentiated them from the Miwok. Apparently the shamans' contests, séances, and the initiation of new shamans were all lacking among the latter people. This greater importance of the shaman among the Southern Maidu

[18] *Individual Participants.* Charley Hunter, a man whom I did not meet, said to be a resident of Knightsville, Sacramento county, was mentioned by the Camino informant as the present head of the Southern Maidu dancers. He took them on one occasion to West Point in Miwok territory, where they gave a performance.

William Joseph was a singer at the *kuksui* dance at Forest Home, Amador county, described on page 232. Henry Charlton, born of Maidu parents in 1863 near Plymouth, Amador county, was another Southern Maidu singer. He was taught dance songs by two older singers, Peter Andreas and an old man named Charley. He paid nothing for the instruction. Besides singing at Ione in Northern Miwok territory, Henry Charlton formerly sang at Forest Home, Amador county, in Southern Maidu territory. He has sung for the *tula*, *kamin*, *wokile* (a Miwok dance equated to *lumenwo*), *hiweyi*, *yomuse*, and *lole* dances, but has never danced himself. Charlton said he had never seen a *kuksui* dance, though it had been performed more than once in his lifetime. His position as singer was given him by the dancers. He mentioned three other singers who sang the same songs as he: Ione Allec, William Joseph, and Dan Gainor. The last is a Northern Miwok and presumably the first is also, judging by his appellation, Ione being in Northern Miwok territory. Whether this mingling of singers from two peoples speaking utterly different languages is typical of border conditions in the past I cannot say.

may have paved the way for the *temaya* becoming the head of the dance organization rather than the chief, while among the Miwok, on the other hand, the chief seems always to have been not only the civil leader but also the head of the ceremonial organization.

I shall discuss under the headings of Shamanistic Setting and Social Setting certain features of Southern Maidu culture which, so to speak, formed the religious setting for the introduction of Yoktco's dances. The features which I refer to are shamans, spirits, and the position of the chief. The dances of the first two strata formed the most important background of all for the introduction of those of the third stratum. The third stratum came as a more varied and advanced form of something which had already been long the vogue.

Yoktco, the Introducer of Dances

I have embodied in the following paragraphs all of the information that I could collect concerning the individual Yoktco. All that can be learnt about such a person who was the moving factor in an important religious innovation is naturally of great use in understanding fully the religious movement itself.

Yoktco, the introducer of the third and latest stratum of dances was said by informants to have dwelt in the vicinity of Mt. Diablo (regarded by the Indians as the home of spirits), Contra Costa county. Actually he lived at the Indian settlement near Pleasanton, Alameda county, but the fact of dwelling near the great mountain, which is visible over a large area in central California, seemed to impress the informants more and may actually have been also impressed upon them by Yoktco himself.

Yoktco normally lived near Pleasanton, but at times came to the Sierra Nevada foothills to teach people dances. One informant said of him that "he travelled by the ocean," probably meaning that he had been to various places on the central Californian coast. Among the Sierra Nevada peoples a visit to the ocean brought considerable prestige to a man as a great traveller. Yoktco is reported to have said that he learned in his youth dances which he in turn taught to the Southern Maidu. In his own days of

instruction Yoktco was locked for sixteen days in the dance house at Pleasanton.[19]

At dancing time Yoktco spoke a strange language, Yokuts or Costanoan perhaps, both of which he would have become acquainted with at Pleasanton, where resided the Indians formerly gathered at Mission San Jose, Alameda county.

When Yoktco came to Ione, in Northern Miwok territory, to give instruction he brought dancers from Pleasanton to show the Ione people the steps. He also taught his dances at Folsom in Southern Maidu territory. There he taught *hiweyi*, *kilaki*, *kuksui* (with two performers called *kuksui* and *musil*), *mamas*, and *ta*.

Yoktco was a dreamer who made public his dreams as divine revelations. In this respect his teachings seem to resemble those of the *maru* or Ghost Dance dreamers of the Pomo.[20] Yoktco dreamt of an altercation between Moon and Coyote. The former said people were to die and return in three or four days. Coyote said they were to die and not return, and that people were to cry for them. Yoktco did not predict the end of the world, but he did present an equivalent idea, for he dreamt that this world would be filled by white people and that there would be another world for Indians. He taught that people would live long and never be sick longer than a day or two if they danced. The informant, Jim Dick was seven or eight years old when Yoktco died. He probably died about 1873 or 1874.

Yoktco's successor was an old blind man named Rice, whom Yoktco named as his successor. Rice was the singing instructor of the Auburn informant Jim Dick when the latter was about twelve years old. Rice died about 1888.

There would seem to be little doubt but that the missionary endeavors of Yoktco were stimulated by the Ghost Dance movement of the early seventies. The dances he introduced may be regarded as the south-central Californian form of the Ghost Dance cult, though they may actually have originated with the

[19] In 1914, a Pleasanton informant mentioned *kuksui*, *hiweyi*, and *lole* as dances formerly shown at that place, thus in part corroborating the list of dances attributed to Pleasanton by Southern Maidu informants.

[20] S. A. Barrett. Ceremonies of the Pomo Indians, Univ. Calif. Publ. A.A.E., XII, 440, 1917.

Pomo, from whom they were perhaps transmitted to the Pleasanton people, and thence to the Sierra Nevada groups with whom the Pleasanton people seem to have kept in close touch. Southern Maidu ceremonies were thus enriched by the addition of more complicated rites introduced from Pleasanton, where they were practised by a mixed population of Costanoan, Yokuts, and Plains Miwok.

To the south among the Northern Miwok a similar, and apparently contemporaneous, teacher appeared from the west. His name was Sigelizu and he was a Plains Miwok of Lockeford, San Joaquin county. He died in 1876. The dances he taught came also from Pleasanton.

Still further south among the Central Miwok there was a great influx of new dances, apparently in the seventies, which were in part attributed to a teacher from the west named Tciplitcu. He was probably a Costanoan or a Yokuts by birth and apparently spoke both of these languages, as well as Miwok. That he, too, first felt the missionary inspiration at Pleasanton seems likely.

Notes on Dances from the South

I have embodied in the following paragraphs the few data relative to the enactment of dances of the third stratum, that is from the south, which I gathered. These dances although bearing the names of dances of the ancient Kuksu cult as practised especially among the Pomo are probably all to be regarded as the ancient dances modified by the vivifying influence of the 1872 Ghost Dance religion.

Hiweyi Dance.—This is the one dance in which offerings of acorn meal are thrown on the fire during the progress of the dance. The dancers wear eagle down. Faye describes this dance as it is performed for the curing of the sick.[21] In 1914, a Costanoan informant at Pleasanton, the place from which it is reputed to have been introduced to the Southern Maidu, spoke of this dance as a shamans' curing dance, thus corroborating the character given it by Southern Maidu informants, as well as their attribution of it to Pleasanton.

My informants report this dance as having been performed at Folsom and Michigan Bar, Sacramento county, Latrobe, El Dorado county, and Auburn, Placer county.

[21] Paul Louis Faye. Notes on the Southern Maidu, Univ. Calif. Publ. Am. Arch Ethn., xx, 51, 1923.

Kilaki Dance.—This dance was shown at Folsom, Sacramento county, and at Auburn, Placer county.

Kuksui Dance.—Latrobe, El Dorado county, was one of the places where this dance was held. As seen there it was described as follows. There were three or four dancers. The *kuksui*, who was Molokui, the informant's mother's father, wore a long cloak and head dress. A dancer described as *kuksui's* partner was called *musil*. *Musil* wore a mass of horse hair evidently in imitation of a woman's hair. Horizontal red and black stripes were painted upon his body and legs, and vertical stripes on his face. On this occasion there were six singers near the drum. The *kuksui* approached the singers as he danced. The informant said that no women or children were allowed to see this dance. At Folsom, Sacramento county, the *kuksui* performance embraced impersonations of both *kuksui* and *musil*.

In a *kuksui* dance seen by Mrs. George Smith at Forest Home, Amador county, a clown (?) participated. He wore a feather skirt and his chest and abdomen were painted with red, white, and black vertical stripes. He had paint on his face, and feathers on his head, but no horse hair. He threatened the audience with a bow and arrow as he danced while the *kuksui* was performing. Five or six companions of the *kuksui* had white down feathers on their bodies, which were made to adhere by first painting the body with a sort of wax. These dancers had red, white, and black paint on their faces. They were called *temaya*, a word also used for the dance manager (see page 225).

Other places mentioned at which the *kuksui* dance was performed were Michigan Bar, Sacramento county, and Camino, El Dorado county. The Camino performance was by dancers from Auburn, Placer county, where it was also danced. The performance of the *kuksui* dance at Camino by the Auburn dancers took place about 1893 and had certain unique features. Several dancers, all representing *kuksui* and wearing turkey feather regalia, took part. There was no *musil* in this performance.

The *kuksui* (dancer or spirit ?) sometimes frightened women when they were going up the creek to gather acorns.

Mamas Dance.—This dance was performed at Folsom, Sacramento county. and at Auburn, Placer county.

Ta Dance.—Four men, six women, and a drum major (*howapbe*) participated in this dance. The singing for the dance was accompanied by stamping on the foot-drum. The dancers evidently squatted, for the informant said they looked as though they were sitting down. They danced in one place without going around the fire. One man occupied a position between the door and the middle of the right side, another between the middle of the right side and the drum, another between the drum and the middle of the left side, and the fourth between the middle of the left side and the door.[22] The six women were divided equally between the two sides of the house, but stood outside (behind) the men, that is, nearer the wall of the circular dance house.

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[22] Right and left are spoken of as viewed from the doorway of the dance house looking into the dance house.

The men danced holding their hands in front of them, palms down, buttocks protruded, legs apart, heads moved from side to side as in negation. The women danced where they stood, raising and lowering their hands, while holding their elbows near their sides. *Wolzo* is the name of the feather headdress worn by the men, *palpal* of the sticks with terminal feathers worn at the sides of the head. Each man carried a *toka* (whistle) which he tooted continually as he danced. The men wore horizontal red (*onoyu*) stripes on the front of the body, also on the arms and legs. Each man wore a back apron (*hikli*) and a breechclout (*mandanikil*).

This dance is reported as having been performed at Camino and Latrobe, El Dorado county, at Michigan Bar and Folsom, Sacramento county, and at Auburn, Placer county.

Tula Dance.—This dance, with the name written *tura*, is described by Faye.[23] My informants mentioned the wearing of eagle down in this dance.

It is reported from Camino, El Dorado county, where it was danced by visiting Miwok from Ione, Amador county. It was also danced at Latrobe, El Dorado county, and Michigan Bar, Sacramento county.

DANCES FROM THE NORTH

Of reputed northern derivation, doubtless antedating introductions by Yoktco, are the following dances: *dape*, *kamin*, *lole*, *luhuyi*, *wulu*, *om wulu*, and *yomuse*. Two of these, *lole* and *yomuse*, are reputed to have been reintroduced from the south by Yoktco, though personally I have grave doubts about this really being the case with *yomusė*. That these dances of reputed northern origin are probably considerably older among the Southern Maidu than the dances introduced by Yoktco is indicated by the fact that in the early seventies Powers[24] encountered on the Bear River the *kamin*, *yomuse*, and *lole* dances, apparently well established. This was about the time that Yoktco, a little further south, was introducing the dances of his cycle. Corroboration of the northern origin of these dances is forthcoming in part from the Northern Miwok, the southern neighbors of the Southern Maidu, who attribute their *luhuyi* and *kamin* dances to a northern origin also.

The *dape* or coyote dance has its parallel among the Northwestern Maidu in the *oleli* dance, in which the coyote is also impersonated. The *lole* dance and the *luhuyi* dance apparently are also common to the Northwestern Maidu where they are designated as *loli* and *luyi*. This leaves unidentified as to Northwestern

[23] *Op. cit.*, 49.
[24] *Op. cit.*, 324.

Maidu origin the *kamin*, *wulu*, *om wulu*, and *yomuse*, which, however, like the *lole*, *luhuyi*, and *dape* have nevertheless attributed to them a northern origin. As these dances appear to be of the same character as those of the God-impersonating cult among the Northwestern Maidu it would seem proper to regard them as belonging to that cult. In connection with the second stratum of dances, and the earliest stratum, there was no "initiation" or shutting of the boys in the dance house; nor did all boys become dancers. Some did not care to. The chief (*huk*) selected the boys for dance instruction, but there was nothing secret about the instruction. Everybody knew the youths were learning. Eighteen or nineteen years of age was the favored age at which instruction was given. The chief also selected girls as dancers for those performances in which women participated. These remarks probably apply also to the dances of the earliest or indigenous stratum.[25]

I shall defer the discussion of the Southern Maidu cultural setting in which these dances were imbedded until after presenting the data concerning the earliest stratum of dances, that to which no foreign origin was attributed.

In the following paragraphs, I present the very brief scraps of information which I obtained concerning the dances of the second stratum, the series introduced from the north.

Dape Dance.—The coyote dance was performed at Auburn before the introductions by Yoktco. The Auburn informant Jim Dick said it was a dance from the north, and in no way associated with the *kuksui* dance.

The clown was also called *dape* (coyote). He might appear in almost any dance. It would probably be as correct to call the *dapepayo* the "clown" dance as the "coyote" dance.

Kamin[26] *Dance.*—Apparently this dance might be performed without

[25] Jesse D., the Camino informant, an elderly man whose parents both hailed from Michigan Bar, although he was born at Latrobe, stated that he became a dancer in his early manhood after he had married, but with the death of his fellow dancers had ceased to dance. He stated that he was drum major (*howapbe*) for the *luhuyi* dance. He also danced in the *kamin*, *yomuse*, and *yokohanup* dances. The informant had seen the Miwok dance called *aletu* at West Point in Northern Miwok territory, but did not know of its being danced by the Southern Maidu.

[26] In Northwestern Maidu kamini means "dance"; in Yokuts *ka'm* means "dance." Cf. Roland B. Dixon and A. L. Kroeber, Linguistic Families of California, Univ. Calif. Publ. Am. Arch. Ethn., XVI, 61, 1919.

feather regalia, for the Shingle Springs informant spoke of seeing it at Latrobe "with feathers," thus implying that on some occasions it was danced without feathers. Faye describes this dance briefly.[27] Powers[28] reports it from the Southern Maidu immediately south of the Bear river. In this dance an old man who arises at one stage and rubs sweat from one of the dancers is paid by him for the service. This act is also performed in the *yomuse* dance of this stratum and in the *lumenwo* dance of the earliest stratum. The *kamin* is reported from Camino and Latrobe, El Dorado county, from Michigan Bar, Sacramento county, and from Auburn, Placer county.

Lole Dance.—A description of the *lole* dance is given by Faye[29] for the Southern Maidu and by Dixon[30] for the Northwestern Maidu, among whom it is called *loli*.

This dance has the remarkable history among the Southern Maidu of having been introduced twice; first from the north, second from the south by the teacher Yoktco about 1872. How long a period separates the two introductions I have no idea. Besides occurring among the Northwestern Maidu, this dance is reported by Powers[31] from the northerly Southern Maidu. He speaks of it as an indoor winter dance.

This dance was seen by the Camino informant at Lula near Latrobe. Both men and women danced it, the women wearing long ear pendants called *howotu*, which reached to the breast. In this dance the body was twisted sidewise. The Shingle Springs informant saw this dance performed at Latrobe (perhaps Lula) by Latrobe dancers, mostly women, but some men. It is also reported from Michigan Bar, Sacramento county, and Auburn, Placer county.

Miss Gayton reports this dance from Goduma village near Sacramento. It was characterized by the use of a long feather rope, held by a number of women, each of whom had a whistle. There were two men on each side, the dancers apparently being in two companies. It was danced for four nights and was followed by a bath in the river. Meat, salt, fish, and grubs were tabu to the dancers, presumably during the four days of the ceremony.

Luhuyi Dance.—The *luhuyi* dance was designated as a dance of the Colfax region by the Shingle Springs woman informant. It was also danced at Latrobe and Michigan Bar. Henry Charlton, a singer for dances, said that the *luhuyi* was a native dance of the Auburn region, which is confirmatory of the attribution to Colfax which is not far from Auburn. It was danced at Camino, El Dorado county, by Miwok dancers from Ione, who on the same occasion danced *tula*. It appears to have been a favorite with Auburn dancers. It was also danced at Goduma near Sacramento, if the name *luhii* recorded by Miss Gayton is the same as *luhuyi*. The following is Miss Gayton's description of it there.

Men and women participated. The women wore woodpecker scalp belts, beads, and abalone ornaments. The men wore flicker feather bands and

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[27] *Op. cit.*, 50.
[28] *Op. cit.*, 324.
[29] *Op. cit.*, 48.
[30] *Op. cit.*, 291.
[31] *Op. cit.*, 324, 325.

down caps, with a flicker feather ornament on each side. Long feather "skirts" were worn. In the ears were "button" shaped "earrings" ornamented with flicker and quail feathers.

So far as name goes this dance would seem to be the analogue of the Northwestern Maidu *luyi*, from which it differs, however, in the use of feather ornaments which are lacking in the Northwestern Maidu performance.[32]

Omwulu Dance.—This dance, of which I obtained no description, was practised at Auburn.

Wulu Dance.—This dance is likewise reported only from Auburn.

Yomuse Dance.—The dancer in the *yomuse* dance, according to the Camino informant, has red or black stripes painted diagonally across the front of his body. Red horizontal stripes are painted on his legs and arms. The *yomuse* is called the "war dance" by the whites, apparently because men and women dance with bows and arrows around the fire in the dance house (*kum*). This dance is reputed to have been introduced twice, once from the north and once from the south. Powers,[34] visiting the Southern Maidu of the Bear River region in the seventies, reports the "*yomussi*" as an open air dance.

This name was recorded by me in a number of forms, apparently indicating obscure vowels. I wrote it, in addition to the above rendering, as *yamazip*, *yomozip*, and *yomuze*. Powers records it as *yomussi*.[33] One informant identified the *yomuse* with the shamans' dance called *lilik*, which seems to be a misidentification. On the other hand the similarity of the names recorded for the dance (*yomuse*, *yomuze*, *yomozip*, *yamazip*) to the names recorded for sucking shamans (*yomin*, *yomuzu*, *yomuse*, *yumizi*) certainly suggests the same stem and a shamanistic origin for the dance. Moreover, the suggestion is strengthened by the use of the cocoon rattle, which in central California is a characteristic instrument of shamans (see also the *yohohanup* dance).

In this dance an old man, who arises at one stage and rubs sweat from one of the dancers is paid by him for the service. This act is performed also in the *kamin* dance of this stratum and in the *lumenwo* dance of the earliest stratum. The *yomuse* was danced at Camino, Latrobe, and Michigan Bar.

INDIGENOUS DANCES

Five dances were named which were said to have been indigenous to the Southern Maidu and for which informants could attribute no foreign origin, either northern or southern. These dances were the *bu* or skunk dance, *lumenwo* dance, *weda* dance, *wetem* dance, and *yohohanup* dance. Of these the *weda* was an out-of-doors affair and probably should be considered as not belonging to the God-impersonating series. The other dances were

[32] Dixon, *op. cit.*, 291.
[33] *Op. cit.*, 324.
[34] *Op. cit.*, 324.

apparently held within the dance house and to the accompaniment of the foot-drum. The *bu* or skunk dance and the *lumenwo* dance, which apparently is the equivalent of the creeper dance among the Northwestern Maidu and the Miwok, are both of the same character as the coyote and other spirit-impersonating dances.

The general religious and social setting of these dances of the earliest series cannot be distinguished from that of the dances of the second or northern series. This matter is discussed under the captions of Shamanistic Setting and Social Setting.

The very brief descriptive notes I gathered concerning these dances are included in the following paragraphs.[35]

Bu Dance.—In the *bu* or skunk dance (*bupaiyo*) the fists and arms are moved as when the animal digs, which produces much laughter in the audience. The dancers have white paint down the back, apparently in imitation of the markings of the animal. The dance is reported from Latrobe and Michigan Bar.

Lumenwo Dance.—The *lumenwo* is described as a performance in which the dancer, who is marked with charcoal, jumps upon one of the dance house posts, hanging head downward. He then slides down the post. It was danced at Brela, Latrobe, and Michigan Bar. By the informant Henry Charlton it was identified with the *wokile*, a Miwok dance. In this dance an old man who arises at one stage and rubs the sweat from one of the dancers is paid by him for the service. This act is also performed in the *kamin* and *yomuse* dances of the second stratum.

Weda Dance.—Exact details of this dance were not obtained, but it seems that the dancers wore wreaths (*wotut*) of wild flowers and that it was danced in front of the houses in the village, not in the dance house. It might be termed the begging dance. A company of dancers would go from house to house, one carrying a basket. Each family contributed food. When the basket was full the dancers divided the contents among themselves. This seeking of food donations was done by visiting dancers as well as the dancers of the host village. This performance took place in the spring when wild flowers were blooming.

The *weda* was said to be an Auburn dance, and not a Latrobe dance. Dixon describes[36] a spring ceremony among the Northeastern Maidu called *wedaboyem*, the date for which is determined "by the relative advance of the

[35] The Camino informant described two performers who perhaps were connected with the earliest stratum of dances, though with what dances I could not learn. (1) *Otneke* was described as a dancer, or perhaps a drummer, who moved his shoulders back and forth, holding his elbows at his sides. His feet were lifted very high as he danced. (2) *Bonuki* was a dancer, perhaps a clown, decorated with red, black, and white paint.

[36] *Op. cit.*, 318.

trees and flowers, for all must be green and budding when the dance is held." Another Northeastern Maidu ceremony, often held when the *wedaboyem* takes place is known as the *kaudom sokondom*. It is characterized like the Southern Maidu *weda* by the seeking for donations of food. The *weda* and *kauda* are mentioned by Powers[37] as Southern Maidu dances in the region immediately south of the Bear river. Powers characterizes the *weda* ceremony as an out-of-doors affair which is divided into three parts, the *hanpawaho*, the *kauda*, and the *weda*. Apparently Powers' *kauda* is the same as the Northeastern Maidu *kaudom sokondom*.[38]

The *weda* was apparently an ancient and widespread Maidu ceremony, but hardly to be called god-impersonating.

Wetem Dance.—The *wetem* was an Auburn dance of olden times which the informant Jim Dick had never seen. He said it was called a "war dance" and that it was danced with bows and arrows.

Yohohanup Dance.—This dance was said to have been danced at Camino, Latrobe, and Michigan Bar. The dancer carries a whistle (*toka*), and either he or the singer uses a cocoon rattle. The Auburn informant Jim Dick said it was not a dance at all, but the name given the singing for the *yomuse* dance.

Further Details about Southern Maidu Ceremonies

In the following pages are given details about the various dances which do not readily fit into the preceding discussion, yet which should be recorded for their value as to localization, individual participation, and details as to paraphernalia.

CEREMONIAL GATHERINGS

In English, the Southern Maidu, like their central Californian neighbors, call a ceremonial gathering a "big time." In the Shingle Springs and Camino region the native term is *lumai*. At Auburn it is *nemusla*. Both of these terms denote a gathering in which people from a distance come. A local gathering is called *huslak*.

The Shingle Springs informant said that the last *lumai* which he attended was at Camino about 1893. Two groups of dancers performed, one composed of Northern Miwok from Ione, the other composed of Southern Maidu from Auburn and Colfax. These groups alternated their performances. On this occasion Jesse D., Sam Kesley, and two or three others decided to give the "big time" even though there was no chief at Camino at this time. They danced all night for three nights. The Ione people

[37] *Op. cit.*, 324.

[38] Dixon, *op. cit.*, 318.

(Northern Miwok) danced *luhuyi* and *tula*. The Auburn-Colfax people danced *kuksui*.

About ten years earlier (1883 ?) the Shingle Springs informant saw a *lumai* ("big time") at what is now Dugan's place, near Latrobe. *Lilik*, the shamans' dance, was performed on that occasion for one day. The other two days of the three were spent in feasting and playing hand-games.

The same informant had attended several *lumai* at Auburn, usually in spring when the wild flowers bloomed. There they danced *kamin* chiefly.

Women attended all dances, according to the Shingle Springs informant. Children did not, because they became frightened. According to Henry Charlton women participated in many dances and were allowed to witness all. It must be borne in mind, however, that Charlton has been much with the Northern Miwok of Ione, so that this statement probably reflects Miwok custom as well as Maidu. Jim Dick, the Auburn informant, said that women could attend all dances provided they were not menstruating at the time. In the valley region, according to Tom Cleanso, women as well as men participated in dances.

After a dance all dancers (or dancers and spectators ?) eat together following a short rest in the dance house. Among the Central Miwok it is the dancers who must eat together, the penalty for infringement of this rule being sickness.

The usual obscurity as to motives prevailed. According to the Shingle Springs informant, George Smith, people "danced for a good time." At Latrobe he said they sometimes danced when a plentiful crop of acorns appeared. Henry Charlton gave "fun" as the motive for dances. The *kamin* dance seems to be connected with the budding of plants.

DANCE CALENDAR

Kuksui, *lole*, and other dances are said to have been danced in summer, while hand games were played in winter when people assembled, according to the Camino informant.

According to the Shingle Springs informant, George Smith, dances at Latrobe took place chiefly in the spring when the weather was good. There was no dancing in the winter there, for it was

difficult to get people to come. Dancing also took place in the fall, but not to any great extent in the summer.

Henry Charlton said that dances might be held at any time of the year, at the wish of the chief.

Jim Dick, the Auburn informant, said that dances were performed in the winter and spring, sometimes in the summer also, usually when there was plenty of food for visitors

Tom Cleanso, a Sacramento informant from the village of Goduma on the north bank of the American river, stated that dances were held at any season and, except in the summer, in the dance house. In summer, dances were held out of doors.

The above evidence seems to point to altitude as the factor in the presence or absence of winter dances. The mountain location of the villages like Camino and Latrobe may have militated against winter dances. Perhaps not only the rigors of winter, but also lack of food for many visitors and lack of ceremonial development were factors.

DANCE HOUSE

The Southern Maidu dance house is called *kum* as is the Northwestern Maidu. No account of its construction was obtained, but presumably it was built as Dixon and Faye describe.[39] The names of certain parts of the dance house are as follows: *pecip*, door; *pundok*, smoke hole; *dul*, drum. The common English name today for such a dance house is "sweathouse," though actually it is many times larger than a real sweat house. According to Henry Charlton this name of sweathouse came to be applied to the large structure because of the fire for drying which was built within, just after the earth covering was put on. Charlton was unfamiliar with the true sweathouse, which probably fell into disuse early.

Tom Cleanso, the Sacramento informant, contrasted the dance house and the sweat house by saying that the former would hold one hundred people and that women were admitted, while the latter would hold only ten or fifteen people and no women were admitted.

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[39] Dixon, *op. cit.*, 172; Faye, *op. cit.*, 45.

DANCE PARAPHERNALIA

Perhaps the huge log drum placed over a pit at the rear of the circular dance house should be considered a part of the dance paraphernalia rather than one of the fixtures of the dance house. However, it is not removed as are the dance regalia. It remains in position over the pit which forms the resonance chamber, whether ceremonies are in progress or not. This foot-drum was reported at all of the Southern Maidu dance houses concerning which we have information, ranging from Goduma village in the valley near Sacramento to the villages in the mountains.

The Southern Maidu chief, like the Miwok, decided when the ceremony was to take place and sent out a knotted string called *pul* when inviting various villages to ceremonies. Each knot stood for a day intervening before the ceremony. Strings with sixteen to twenty knots were sent out. The recipient chief cut off a knot each morning until the time for departure to the place of the ceremony arrived.

The split stick clapper is used by the singers as an accompaniment to their dance songs on the occasion of ceremonies. It is called *wadada* and was probably of the usual central Californian type, though no example was seen.

The cocoon rattle (*wososo*) was not only the instrument par excellence of the shaman, but was also used in the *yomuse* and *yohohanup* dances, the former of which is perhaps connected with the shamans' dance known as *lilik*.

The whistle (*toka*), made of *antai*, a red-barked shrub which grows near creeks, was used in the *yohohanup* dance. It is about fifteen inches long with a hole in the side. It is blown from the end. No example was seen.

Whistles were made also of prairie falcon (*wekwek*) and sandhill crane bones, in the vicinity of Sacramento. The former were reputed to give the better notes. The latter are said to have been used in pairs and blown from the end. These whistles were in part filled with pine pitch.

The *palpal* was a feather ornament worn in the hair on the side of the head. It consisted of a stick with four diverging feathers at one end. It may be identical with the Miwok *sotcenai*.

No exact description was obtained of the feather headdress called *wolzo* which is worn in the *ta* dance.

Hikli is the name of the feather-covered net, perhaps best characterized as a cape, usually worn suspended from the shoulders or the buttocks. For an illustration of it, see Dixon, plate 40. The Southern Maidu *hikli* was made of the feathers of black birds, presumably crows.

Mandanikil was the name given a breech-clout worn by male dancers. Its exact nature and antiquity were not ascertained.

Wotut is a wreath of flowers worn by dancers in the *weda* dance in the spring when the wild flowers are blooming.

Eagle down is worn in the *tula* and *hiweyi* dances and charcoal utilized for the black markings in the *yomuse* and *lumenwo* dances.

Miss Gayton records from the Sacramento informant the use in that region of flicker feather bands by both men and women; and of woodpecker scalps on bands, on belts, and on a form of headdress worn by men. She also reports the former use there of black face paint for male dancers. Men wore their hair "braided" and used a net to hold it on the head. Hair pins made of sandhill crane bone were used. Earrings or ear plugs were worn by women dancers.

Shamanistic Setting

Under the caption of Shamanistic Setting, I shall discuss briefly the data which I gathered as to other phases of religion (chiefly shamanistic) among the Southern Maidu contemporaneous with the dances which have been discussed in the preceding pages. This religious setting may be regarded as the environment in which the first and second strata of dances were, so to speak imbedded, and upon which the third stratum of dances, that introduced about 1872, was superimposed.

SHAMANS

Prominent features of Southern Maidu religious activities contemporaneous with the dances of the two earlier series, and perpetuated after the introduction of the dances of the third series, were the various activities of shamans which manifested themselves in three important observances. These activities were the

initiation of boys who expected to become shamans, the contest of shamans, and the séance in which the spirits of the dead were conjured. I use the word "spirit" advisedly as the Southern Maidu distinguish between the visible ghost (*üzwüze* or *us*) and the invisible spirit (*gakil*). The latter is also at times called a devil. The *üzwüze* and *gakil* are not to be confused with the spirits that appear to the dance manager in connection with the dances of the third series. These spirits appear in dreams and are denoted by the term *nedi*. Although human in form they are regarded as different from the ghosts or spirits of recently deceased individuals.

The principal functions of the shaman among the Southern Maidu were the same as everywhere else in central California. The curing of disease by suction was his principal activity. In the hill country of the Southern Maidu region the sucking shaman was called *yomim*. In the valley he was called *yomüse*. The terms *yomuzu* and *yumizi* were also recorded. Such a sucking doctor might at times be accused of malevolent practices. There was, however, a special name applied to a shaman who was regarded as a habitual "poisoner." The term was *hosimum*.[40]

From the close resemblance of the name of the *yomuse* dance to the word for shaman, it seems likely that the dance may be an outright performance by shamans, as one informant said. This probability is strengthened by the use of the cocoon rattle (the characteristic shaman's rattle in central California) in the dance.

As will appear later, the author regards shamanism as a not improbable source from which the God-impersonating cult developed. In addition to the linguistic evidence just cited, further linguistic evidence is to be noted in the use of the stem *yom*, as in *yombasi* (the term for a secret society preliminary initiate[41] among the Northwestern Maidu) and *yomta* (the term for the head of the secret society among the Patwin and Pomo).[42]

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[40] John Powell, a Northern Miwok, was said by a Maidu informant to be one. His "poison medicine" was *wene*, presumably a plant.

[41] Kroeber. Handbook, 372.

[42] Edwin M. Loeb, *op. cit.*, 365.

SHAMAN'S INITIATION

Boys who were to become shamans were initiated by the established shamans. They were placed in pits with "medicine" and "killed" with a piece of "poison medicine" about half an inch long. With such "poison" a large stone a quarter of a mile distant could be lifted two feet, so it was believed. The initiates were able to handle red hot stones. Boys were also taken to the hills and nearly starved in making shamans of them. Although their relatives brought them food, this was taken from them by the shamans in charge and inferior food substituted.

It was customary to "fix" shamans so they could eat new fruits. This was done by other shamans pressing the body. This was done, however, at least by the Auburn people apparently, as by the Miwok, for all people, not just shamans alone.

SHAMANS' CONTEST

This is evidently the performance called by Faye the *lomusem payok*,[43] but called by my informants *lilik*. It is called *tuyuka* by the Northern Miwok. In this performance the dancers who are all shamans shoot one another with their "poison sticks," *sila*, doing so from a long distance. The "poison" is believed to be kept in oak balls from which it is taken when ready to be shot at someone. The shamans from each district form a party by themselves.

When shooting the shaman makes a hole in the ground with his heel, raising a little mound of earth by turning his heel in the soil. He takes the "poison" between the thumb and finger of his right hand. Then he points at his victim with his left hand, stooping and striking the pile of dust as he throws his poison with an underhand motion of his right arm. Sometimes the intended victim, if he is a good shaman, catches the "poison" as it flies towards him. The "poison sticks" have been dipped into strong "medicine" and they sometimes knock over even a "good doctor."

The visiting shamans, say from Ione, shoot at the party of local shamans, sometimes from a distance of four hundred or five

[43] *Op. cit.*, 46. For an account of the shamans' contest among the Northwestern Maidu, see Dixon, *op. cit.*, 272.

hundred yards. The local shamans dance with chests expanded and arms held back in a nearly horizontal position. When one is struck by a "poison stick" he sometimes falls prone and unconscious to the ground. If he is not attended by his shaman friends within half an hour he will die. The majority of victims get up without aid and spit out the "poison" which is laid on a rock. Sometimes there is an accumulation of "half a panful" of "poison sticks." The Shingle Springs informant claimed to have seen such an accumulation himself.

After shooting away their "poison" as they approach, the visiting shamans join the host shamans and dance around a fire out-of-doors. This performance is usually on a summer's day. They dance both to the right and to the left. At times people who are not shamans participate in this dance, but they have to be "careful."

Sometimes a stout stick is driven into the ground and shot at with the "poison sticks." A weak shaman will knock only a little off of the top with his "poison," a powerful shaman will break off a good deal or knock the stick over completely.

SÉANCES.

Certain shamans were reputed to be able to talk directly with the spirits whenever they wanted advice as to what people should do.

Séances were not uncommon.[44] A cocoon rattle was used in this operation and *gakil*, the spirits of the dead, were conjured. The séance took place at night. The interior of the dance house (*kum*) was without a fire, and dark. For five or ten minutes the shaman shook his cocoon rattle (*wososa*). Then a roaring sound was heard outside, at which the shaman lay down and ceased shaking his rattle. After a few minutes the spirit arrived, picked up the rattle, shook it a little, and mumbled. The spirit told the assembled people what was happening at the place he came from; he also told them to be kind to one another; and he would foretell whether the acorn and other crops would be good. The spirit

[44] At Auburn Captain John (Indian name Oite) was a shaman who conjured spirits.

would discourse thus for half an hour, then drop the rattle, and depart with the same roaring sound with which he arrived. Several spirits would come in the course of one evening's performance. Sometimes a coyote spirit came. It was recognized afar by its howling. Then everyone would make a peculiar sound with his mouth, blowing vociferously. This would drive off the coyote spirit.

Two Miwok men from Ione came to Auburn on the occasion of a séance which the Shingle Springs informant attended. A man had been murdered at Ione, but the Ione men forgot to tell the Auburn people about it. However, the murdered man's spirit came and told about it. The two Ione men did not attend the séance, but slept outside of the dance house. One man was awakened by the noise in the dance house and tried to arouse his companion. He shook him in vain, for he was as one dead. His spirit had gone to the meeting but later returned. It is obvious from this account that the Southern Maidu believe that the spirits of the living as well as the dead may travel at will.

The Shingle Springs informant knew of no séances at Latrobe or Camino. Powers[45] describes a Southern Maidu séance, which appears really to have been an impersonation. I think this instance is of importance as showing how the God-impersonating cult might gradually have developed from such shamanistic performances.

GODS AND SPIRITS

The Kuksu or God-impersonating religion, as its name implies, is one in which nature spirits and human spirits are impersonated. It is therefore of interest to note what particular spirits were recognized by the Southern Maidu. I have already dwelt upon their discrimination between the human ghost and the human spirit, the former visible, the latter invisible. A third class of spirits allied to these, since they are believed to represent long dead human beings, is the *nedi* of which I have spoken in connection with the third stratum of dances. As with that stratum of dances, it seems likely that the *nedi* spirits represent a new and

[45] *Op. cit.*, 326. For sèances among the Northwestern Maidu, see Dixon, *op. cit.*, 271.

recently introduced concept among the Southern Maidu, a concept which appears to be related to that of the Ghost Dance cult among the Pomo, where the priest sees in his dreams the dance spirits, just as the *temaya* or dance manager does among the Southern Maidu. That the Southern Maidu concept is to be regarded also as a manifestation of the Ghost Dance religion I have already stated.

There are, however, certain nature spirits for which no generic term was obtained. These seem to be regarded as never having been embodied in a mortal human frame, although they are evidently conceived of as being human or part human in form. I learnt of but two such nature spirits, the wood spirit Kuksu and a water sprite called Unai. Unai is described as part human baby and part fish in appearance, and as crying like a baby. Perhaps it is allied to the Plateau Shoshonean "water baby" (*paxwa*).[48]

The Shingle Springs informant, George Smith, had never seen the sylvan spirit Kuksu, but he knew of an old man who lived near Dugan, El Dorado county, who occasionally saw one in that vicinity. Whenever he saw it, blood came from his mouth. The *kuksui* dancer is said to dress like the "wild" *kuksu* but has no connection with him.

The great horned owl (*humhum*) although apparently not classed as a supernatural being is reputed to carry away babies at times. A story runs to the effect that a baby thus carried away lived for a week in the owl's nest.

MANUFACTURE AND CARE OF DANCE REGALIA

The following notes on the manufacture and care of dance regalia undoubtedly refer to dances of both the third stratum and the two earlier strata. They show the great extent to which the shaman was concerned with the God-impersonating cult. Without the intervention of the shaman, god-impersonation, according to native belief, would be an impossibility, as will be clear when the shaman's function in that connection is discussed in the succeeding paragraphs. This function of the shaman in connection with god-impersonation seems to be lacking or but weakly developed

[48] E. W. Gifford. Western Mono Myths, Jour. Amer. Folk-Lore, XXXVI, 304, 1923.

or unrecorded among the Pomo, Patwin, and Northwestern Maidu. It is, however, an important feature among the Sierra Miwok as well as the Southern Maidu and should perhaps be regarded as a fundamental feature of the two earlier strata of dances, among the Southern Maidu, which was carried over to the third series of dances introduced by Yoktco.

As with the Sierra Miwok the feathers that are used in dance regalia are sacred. The Auburn informant explained this, so far as eagle feathers were concerned, upon the basis that the eagle is a great and sacred "chief" and that therefore its feathers and down are sacred and the dancer who wears them must be treated as carefully as the eagle would be treated. The special "poisoning" treatment of the feathers of dance regalia, which made the regalia dangerous to non-dancers, however, may have been the chief factor in the matter of "sanctity," rather than any inherent sacredness attaching to the birds whose feathers were used.

Feather aprons (*hikli*) and other dance regalia were made out of doors. It was believed that young children would die if these objects were made inside the house. After an object was completed it was "poisoned" by a shaman. "Poisoning" presumably consisted in sprinkling certain pulverized or masticated roots over the objects as is done by the Central Miwok. Such "poisoned" dance regalia were not kept in the dwelling house but in the hills, being in the custody of a shaman. One informant gave as the motive for "poisoning" the desire to make the objects untouchable to ordinary Indians.

When the regalia are to be used they are turned over to the head dancer by the shaman who has had them in charge. He "doctors" the head dancer so he can safely handle the regalia. In the same way each dancer who is to wear feather objects must be "doctored." The treatment consists of the shaman blowing on each person so that he will not be "touchy" and jerk back when the feather ornaments are put on. Even a woman, when picking up another's child blows on it first for the same reason. The shaman also puts wormwood in a short tube made of a hollow root (not a tobacco pipe). He inserts a live coal and then moves the tube over the dancer's body, head, arms, and legs, so that the

smoke comes in contact with him. Without this precautionary measure, it is believed that the "poisoned" feathers would make the dancer sick.

A non-dancer must not touch the person of a dancer or his feather regalia. To do so might make the non-dancer ill or make the dancer weak.

Professor Kroeber informs me that the regalia of the Hesi cult were sacred and untouched among the Patwin anciently, but that in the modified form of the cult now practised they may be donned by anyone without fear of sickness resulting. This reversal of feeling is due to Ghost Dance religion influence. Among the Southern Maidu and Sierra Miwok the Ghost Dance religion effected no such change. The feather regalia are still feared and venerated and, among the Northern Miwok at least, are the objects of seed offerings.

Social Setting

There were no moieties among the Southern Maidu so far as could be learned, though the neighboring Northern Miwok have totemic moieties. Therefore, the matter of special moiety paint patterns for certain dancers does not enter into ceremonial affairs. Apparently the social and political organization of the Southern Maidu was similar to that of north central California in general, the village community being the political unit, and being without sibs.

A brief presentation of the data concerning villages and chiefs follows because of its value as an aid to understanding the God-impersonating cult.

CHIEFTAINSHIP

The Southern Maidu chief is called *huk*,[47] the same term as used by the Northwestern Maidu. Unlike the Northwestern Maidu official of the same name, the Southern Maidu chief was an hereditary official, who selected his own successor. The shaman is said to have had nothing to do with this, but the people ratified the old chief's choice. The chief's sons were called *huk* and the

[47] A single informant at Camino gave the term *anakalde*, evidently Spanish *alcalde*.

oldest usually succeeded his father. Sometimes a daughter became chiefess if she were considerably older than her brothers. Among the Southern Maidu, such a woman chief bore the title of *mayen* (cf. Miwok *mayengo*, Costanoan *mayin*). There are said to have been two such chiefesses at Nashville, El Dorado county. The Southern Maidu female chiefs who bore this title were either wives or daughters of chiefs. Such a chiefess functioned when the chief died without a male heir. She gave ceremonies like a male chief.

In these aspects Southern Maidu chieftainship resembled the institution among the neighboring Miwok rather than among the Northwestern Maidu. Chiefs regulated the gathering of wild food, so that inhabitants of villages would not fight one another.

Among the Northwestern Maidu, according to Dixon[48] the village chief apparently did not function as the head of the secret society which produced the elaborate ceremonies of the God-impersonating religion, while among the Southern Maidu, as among the Miwok, the chief is the person who sets the time for and supervises the arrangements for the ceremonies, there being no secret society so far as I could learn and as Powers reports.[49] The chief orders the people to prepare the necessary food and is said to have been "boss over the dancers," calling the dancers and singers together. In short, in the south the chief is both a civil and ceremonial official, in the north he is the former only.

Although the chief (*huk*) issues the call for and supervises ceremonies, he does not dance. It is incumbent upon him to feed the visitors, which he does by commandeering the services and supplies of his people. His wife, the *mayen*, assigns to women of the village the duties of pounding acorns, making soup, and so forth.[50]

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[48] Roland B. Dixon, *op. cit.*, 223, 224, 322 ff., 1905.

[49] *Op. cit.*, 326.

[50] Former Southern Maidu chiefs were:

(1) Koloma Charlie who was chief at Shingle Springs, or at a village site about two miles from Shingle Springs, where there was a dance house and where dances were held during the girlhood of one informant, probably about 1870.

(2) The father of Hattie Thomas of Camino was formerly chief at Pakantii at Camino. Hattie said that he was made chief by the people because they liked him. Hattie was *mayen* (chiefess) when her father was alive.

VILLAGES

Hüpüw, literally "houses," was the word obtained for village. This term was equated to the Northern Miwok term *nenasü*, which means the patrilineal ancestral home. Apparently, however, *hüpüw* has not this last meaning exclusively in Southern Maidu, for the informant said that *hüpüw* meant the village of one's birth and that this might vary with different children in the same family. The *hüpüw* of the informant, Henry Charlton, of his father, and of his mother, was the village of Yule, at Pokerville, near Plymouth, Amador county, close to the Maidu-Miwok boundary.

Although a number of villages, perhaps for a distance of twenty miles, spoke the same sub-dialect, each village was politically independent and there was no chief over all.

Near the foothills rises of natural ground were selected for sites. Along the lower courses of the rivers, village sites like that at Slough House, Sacramento county, on the Cosumnes river, were artificial mounds[51] which were heaped up to form a sufficient elevation to preserve the huts from flood waters. The earth for such a mound was carried in baskets on the heads of villagers and dumped in the appropriate spot to form the village site. Proximity to food supply influenced the selection of the site and prompted the laborious process of mound building. In the case of the mound which I examined it was said that the abundance of oak trees and the proximity of the affluent Deer creek influenced the selection. It is said that the building up of such a small mound took about a week and that all of the men and women of the community participated in the work. Such a site is said to have been occupied the year around, winter and summer. The particular one which I refer to at Slough House was occupied by Southern Maidu, speaking the same sub-dialect as the informant.

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(3) Helu, chief of Yule; also chief of Homit, probably later. Helu succeeded while his father was alive because of the latter's advanced age ("115 years"), the father dying about 1880.

(4) The father of Helu, chief of Yule.

(5) Motos or Charlie, chief of Palama. Died ca. 1880.

[51] Cf. Powers, *op. cit.*, 316.

House flies were anciently scarce at such sites. Their abundance now is attributed to domestic animals.

In pre-American days the river at high water spread far and wide over the low lands, as there were no levees to restrain it. The informant estimated that the villages were two or three miles apart. At the time of flood water, people waded and swam from one village to another or else traveled on logs lashed together as a raft. It is said that no dugout canoes or tule balsas were used. Tule, however, was used for house thatch.[52]

Conclusions

The absence of rigid localization of dances such as prevailed in northwestern California and the custom of dancers from one locality presenting their dances elsewhere must have been great aids to the diffusion of dances. That dances were thus exhibited away from home in ancient times we cannot be certain. Since the coming of the white man, however, it has been a common custom, which makes it seem likely that such may have been the practice anciently as well. A notable example of modern display of dances away from home took place about 1883 when the Northwestern Maidu dances *hesi*, *salalu*, and *yokola* were performed at Colfax by dancers from Chico. In this particular case they were not adopted by the Southern Maidu among whom they were displayed, but in the preceding pages I have given a number of

[52] Villages mentioned by informants:

(1) Homit, about four miles north of Ione, Amador county. Last large village after coming of whites. Said to have been at border of Maidu and Miwok territory. Site of village owned by white man named Grant, later by a cattle company.

(2) Palama, at Forest Home, Amador county, on land now owned by white man named True.

(3) Yule, at Pokerville, near Plymouth, Amador county, on land owned by white man named Tom Pender. According to Kroeber (*op. cit.*, 394) this village was Miwok, not maidu.

Villages 1, 2, 3 were said to lie in a region called Wahap, which one informant gave as his "tribal" name.

(4) Pakantii, at Camino, El Dorado county. Probably at the highest altitude of any Southern Maidu village, and likely to have been only a camp site anciently.

(5) A village on property of Jack Johnson, near Brela, El Dorado county. Dance house there, as *lumenwo* danced.

(6) Lula, near Dugan, El Dorado county.

instances of adoption of new dances, notably those from Pleasanton. In the case of the Pleasanton dances there would seem to have been a factor present that was probably lacking when the Chico dances were shown at Colfax. The factor I refer to is that of the missionary teachings of the Ghost Dance religion as to efficacy of the dances to bring about certain desirable results, such as longevity.

It would appear that the stock of dances in the Southern Maidu foothill region was scanty before the appearance of the teacher Yoktco in the seventies of the last century, and comprised at the most the *bu*, *dape*, *kamin*, *lole*, *luhuyi*, *lumenwo*, *weda*, *wetem*, *wulu*, *om wulu*, *yomuse*, and *yohohanup*. Of these the *dape*, *kamin*, *lole*, *luhuyi*, *wulu*, *om wulu*, and *yomuse* were attributed to a northern origin antedating the time of Yoktco's teachings. This would leave as an underlying substratum, unattributed to any other region, the *bu*, *lumenwo*, *weda*, *wetem*, and *yohohanup*. Of these the *weda* was not performed in the dance house and apparently did not belong to the God-impersonating Cult system.

Dixon writes of the northwestern Maidu dances in the vicinity of Chico in the Sacramento valley that "a large part of the whole dance series was obtained directly from the Wintun (i.e., Patwin) Indians by the Maidu."[53] Unfortunately he does not indicate which dances were borrowed from the Patwin and which formed the original native stratum. Kroeber,[54] from Patwin sources, lists *k'aima*, *toto*, *lole*, and *keni* as dances borrowed by the Northwestern Maidu of Chico from the Patwin.

A similar stratification of dances is found among the Northern and Central Miwok, where a small series constitutes the earlier stratum of the foothill region. The later stratum which apparently was introduced from the west about 1872 consisted of much the same dances as were introduced into the Southern Maidu region at the same time. The stimulus behind this missionary movement was doubtless the Ghost Dance movement of the seventies. Whether such was also the case with the introductions among the Northwestern Maidu Dixon fails to indicate.

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[53] *Op. cit.*, 288, see also 308.

[54] Handbook, 385.

Kroeber,[55] upon the assumption that such dances as the *kuksuyu*, *lole*, and *hiwei* were ancient among the Miwok, states that the Miwok, and apparently the Costanoan and Salinan stocks, seem to have participated rather in the Pomo (Non-Hesi) than in the Patwin (Hesi) form of the ritual. More recent information, which I have obtained, indicates these dances to have been introduced among the Miwok presumably about 1872. This being the case, his conclusion would require modification as follows: That the dances introduced among the Miwok in recent times, and probably as a result of the Ghost Dance movement, were of the Pomo (Non-Hesi) rather than the Patwin (Hesi) type. The same statement holds also for the Southern Maidu. It obviously does not hold for the Northwestern Maidu who received the Patwin or Hesi form of the cult.

It seems likely that we are dealing with two great developments in the Hesi (Patwin) and Non-Hesi (Pomo) rituals, both based on a single widespread foundation. The foundation perhaps is represented by the underlying stratum of locally varied dances found in the Sierra Nevada foothill region from the Northwestern Maidu to the Southern Miwok and by the simple form of the cult found among the Yuki, coast Pomo, and Coast Miwok. While these simpler manifestations of the cult continued to flourish in these peripheral regions there were developing two areas of specialization and complexity, namely the Patwin and the inland Pomo, as we shall call them for convenience. The exact area occupied by the Pomo (Non-Hesi) type of the cult is difficult to define, but it is possible that it extended as far south in the Coast Range as the Salinan territory. However, this extreme southern extension is more likely to have been the result of a late spread rather than of an early development. In fact, it is not impossible that the spread of the Non-Hesi form of the cult to the mixed Yokuts, Plains Miwok, and Costanoans at Pleasanton, and to the Salinans, may have been more or less contemporaneous with its spread in the seventies to the Sierra Miwok and Southern Maidu. Only modern investigators have recorded the dances of the cult at Pleasanton in Costanoan territory and among the Salinans.

[55] Handbook, 381.

Although the probable spread of the Non-Hesi form of the cult to the Costanoan and Salinan peoples is involved in a certain amount of obscurity, its spread to the Southern Maidu and Sierra Miwok is somewhat clearer, it having reached those peoples apparently in the early seventies and through the medium of the Ghost Dance movement. Probably antedating, but perhaps in part coinciding with, this spread of the Non-Hesi form of the cult to the Southern Maidu and Sierra Miwok was the spread of the Hesi form to the Northwestern Maidu.

I would emphasize again that in the whole Maidu and Sierra Miwok region there was already existent a type of dances performed in the earth-covered dance house which formed good soil in which the highly evolved form of the Patwin (Hesi) and Pomo (Non-Hesi) readily took root. What these supposedly primitive dances were like among the Southern Maidu has been revealed so far as possible in this paper. What they were like among the Northwestern Maidu can be only conjectured. What they were like among the Sierra Miwok will be made clear with publication later of my manuscript notes. That a similar early and simple form of the God-impersonating cult prevailed in the Costanoan and Salinan regions is likely, but we have data only from the Salinans that apparently concern this matter; and moreover, the possibility, remote as it seems to me, should not be overlooked that the Costanoans rather than the Pomo may have evolved the so-called Non-Hesi type of the God-impersonating cult. The *kuksui*, *hiwei*, and *lolei* dances have been recorded as danced in former Costanoan territory by the mixed population of Plains Miwok, Yokuts, and Costanoans formerly of Mission San Jose[56] and by the Salinans formerly of Mission San Antonio.[57] In addition, among the Salinans there were practised dances which Mason speaks of as Owl, Deer, Coyote, and Bear. It seems entirely possible that these four dances represent an early stratum of dances of the God-impersonating type and that *kuksui*, *hiwei*, and *lolei* represent modern superimposed dances perhaps contemporaneous with the

[56] Author's notes.

[57] J. Alden Mason. The Ethnology of the Salinan Indians, Univ. Calif. Publ. Am. Arch. Ethn., x, 177–179, 1912; Kroeber, Handbook, 371.

later introductions among the Southern Maidu.[58] Mason mentions a dance house among the Salinans. Possibly it was introduced with the dances *kuksui*, *lolei*, and *hiwei*, but it seems more reasonable to believe, as suggested by Mason's context, that it was ancient and connected with the dances of the supposedly older stratum.

It would appear then that in pre-Caucasian times the God-impersonating Religion of central California was quite widespread and represented by a considerable series of local dances. That there was even then more or less diffusion of dances taking place is suggested by the reputed northern origin of certain of the Southern Maidu dances. But apparently the great influx of dances into the Maidu and Sierra Miwok regions, and perhaps to Pleasanton in former Costanoan territory and to San Antonio in former Salinan territory, took place only in Caucasian times and presumably about 1872. Identity of names for a number of dances among such diverse peoples would seem to argue recency for the spread of the dances. The great wave which carried such dances as *kuksui*, *hiwei*, *lolei*, and others into the Sierra Nevada foothills and perhaps to Pleasanton and San Antonio appears merely to have superimposed upon an older stratum of dances a new stratum of the same general God-impersonating type as the older, but modified by the leaven of the Ghost Dance Religion.

It is possible that the element of dreaming which appears so prominently in connection with Yoktco among the Southern Maidu was new, but of this there is no certainty, since nothing is known as to whether or not dreams played a part in the older stratum of dances. However, the dreaming on the part of the *temaya* or dance director strongly suggests the similar phenomenon among the so-called *maru* priests of the Ghost Dance Cult among the Pomo.

The doubt as to the antiquity of the dreaming by the dance manager (*temaya*) among the Southern Maidu naturally has as a corollary doubt as to the antiquity of the Southern Maidu *nedi* dance spirits about which he dreams and suggests the possibility

[58] However, it should not be overlooked that Spanish travellers (notably Fages) in the eighteenth century were struck by the fact that women performed dances among the Salinans. Perhaps the *lolei*, a woman's dance, was what they witnessed. See Mason, *op. cit.*, 179.

again of 1872 Ghost Dance influence. As far south as Madera county an informant spontaneously informed me that the names of Southern Miwok dances were the names of dead people, exactly as did a Southern Maidu informant. If this concept is not connected with the 1872 Ghost Dance, then it seems likely that it is an ancient concept that characterized the God-impersonating cult. Ghost impersonations were a marked feature of the old cult among the Pomo.

The relation of shamanism to the God-impersonating cult is an important matter bearing upon the possible origin of the cult. Among the Southern Maidu, and of course among other groups as well, it appears to me that there are such connections between shamanism and the activities of the cult as to suggest that the latter may have arisen from the former. The features I refer to are (1) the "poisoning" of dance regalia by a shaman; (2) the necessity of a shaman's aid in donning the regalia; (3) the fact that a shaman cares for the regalia when not in use; (4) the probable identity in part of shamans' guardian spirits and spirits impersonated in dances; (5) the overlapping of the practices of spirit-impersonation and spirit-conjuration; (6) the parallel purposes of some shamanism and of some dances as exemplified in (a) curing, (b) insuring abundant food; (7) the apparent derivation from a single stem of certain shamanistic and secret society designations.[59]

That it is justifiable to speak of the Southern Maidu dancers as forming a "secret society" I very much doubt. Powers, who was familiar with the Northwestern Maidu secret society, says there was none among the Southern Maidu.[60] On the basis of the evidence presented in this paper the term "secret society" hardly seems warranted. It would appear, however, that the introduction of new dances by the teacher Yoktco, even though due to Ghost Dance stimulus, brought with it a definite custom of confinement and instruction for the young prospective dancers and singers which hitherto had not been practised, or practised but half-heartedly, in the earlier strata of dances.

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[59] See page 243.

[60] *Op. cit.*, 326.

PREHISTORIC INHABITANTS OF CRAWFORD COUNTY, KANSAS

By VERNON C. ALLISON and VANCE RANDOLPH

PREHISTORIC artifacts are not particularly abundant in southeastern Kansas but those found offer interesting and convincing evidence of a long occupancy before the coming of the white man. The collection of Mr. Andrew M. Brooks of Pittsburg is, as far as we know, the most extensive and complete ever made in this locality. This material has never been properly labelled or described, and, as these small private collections are subject to many hazards and vicissitudes, it seems worth while to make some permanent record of Mr. Brooks' work here. It will be very gratifying to the authors if this paper should arouse further local interest in the matter and stimulate future research.

The Brooks collection comprises some eight hundred pieces altogether, including metates and pestles, broken pottery, double-bitted axes or hoes, knives, spear heads, drills, scrapers, and a great number of arrow points. These objects were all picked up on the surface within four or five miles of Pittsburgh, some of them being found within the present corporate limits. The most favorable time to look for flint artifacts is just after a shower, as the rain washes the dirt from the light-colored flints and renders them much easier to see.

One of the best hunting grounds for these flints is an area on South Broadway, near the former site of the famous Bucket-of-Blood saloon, and now used as a Catholic cemetery. A great many specimens, particularly the tiny bird-arrow points, have been picked up here. Another old village site is located in what is now Lincoln Park. A sandy corn field on the west bank of Cow Creek, four miles west of Pittsburg on the Fourth Street road, has yielded a great variety of artifacts. Another rich field lies about a mile upstream, on the east bank of the creek, just north of the Twentieth Street road. An ancient camp-ground of lesser importance has been found on the J. B. Smith farm just west of the

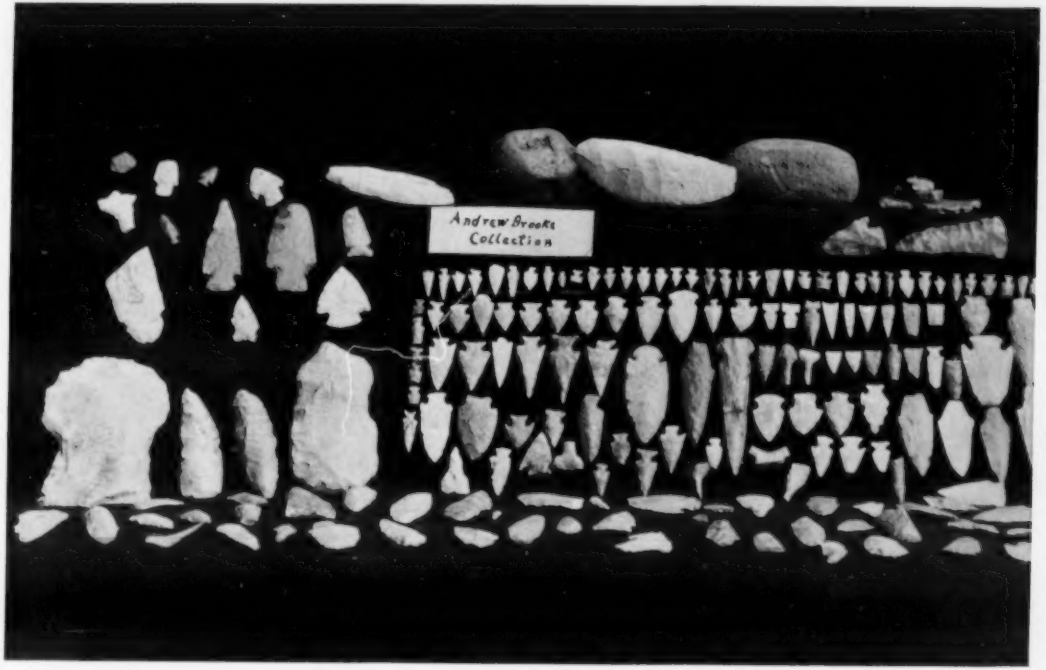

PLATE XXXIII.—The Andrew M. Brooks Collection of Indian objects from the Pittsburgh vicinity.

PLATE XXXIV.

city and south of the Quincy Street road. The early white settlers established a burying-ground on a small knoll at this place, and some of the crumbling head-stones may still be found; sunken graves here frequently reveal patches of red dirt, possibly old fire hearths. The present owners of the hill often plant corn upon the eastern slope toward a small swampy area lying between the knoll and the creek, and it is very probable that they are unwittingly following the example of their red predecessors. One interesting object picked up near this site resembles a broken double-bitted flint axe. About four hundred yards southeast of this knoll is a second village site located in a sharp bend of the creek, the open end of the bend facing the east. Another of the double-bitted axe-like specimens was found by Mr. Robert J. Ketterman on Lightning Creek, about one and one half miles north of the Fourth Street road; the creek is here running almost due west with a high northern bank, and the specimen was found upon the south side of the stream. Joseph B. Thoburn (Secretary Oklahoma State Historical Society and Curator of the State Archaeological Collection, Oklahoma City) points out, however, that these implements are never found with really keen edges, and suggests that they are probably not axes at all, but hoes used by people of Caddoan stock. The rough flint object at the right of Plate XXXIV was also found on Lightning Creek by Mr. Ketterman. It may represent a crude attempt at a Caddoan hoe or it may be an old flint core from which flakes were hammered to make arrow points, and so forth; it possesses a noticeable patina or polish and if this comes from long use, the artifact is a crude, early Caddoan hoe.

Thoburn, from the inspection of the photographs of the flint artifacts in Plate XXXIII, concludes that approximately three-fourths of the specimens are of Caddoan origin and the remaining twenty-five per cent Siouan (Osage). He draws this inference from the relative proportions of the two types of bird points, i.e., small flint points used on the projectiles thrown from blow-guns made of hollow reed or cane. The Siouan bird points are commonly triangular with no barbs or nicks near the base and even when they are nicked it is just slightly and rather farther from the base than in the same class of artifacts of the Caddoan culture.

The Siouan people have always, so far as known, used the small hide scrapers fastened to pieces of elk antler about eight inches long. The prehistoric Caddoan people did not so use the hide scrapers but the historic Caddoan people did fasten their hide scrapers to pieces of antler; the inference is that the Caddoan people borrowed this method from some other people within historic times.

Both Siouan and Caddoan people made pottery though the Caddoan far excelled the Siouan in this art. The fragments of crude black pottery shown in the upper right-hand corner of Plate XXXIII are probably of Siouan origin.

The two large crude flints in the lower left-hand corner of the same plate are undoubtedly Caddoan hoes, as is also the object at the left of Plate XXXIV. According to Thoburn the people of Siouan stock entered Oklahoma about four or five hundred years ago from the east and they displaced the people of Caddoan stock who had come in from the South four or five hundred years previously. The Caddoan people were preceded by an unknown people coming from the southwest who built mounds for ceremonial purposes (Iroquoian?). The same sequence observed in Oklahoma apparently holds good for Crawford County although the unknown people (Iroquoian?) probably came into only very transitory contact with this district as no mounds other than Siouan or Caddoan sepulchral or domiciliary mounds have been found west of extreme southeastern Kansas. Plate XXXIII shows several very crude points without notches or barbs, and these may represent still more remote cultures than those previously described.

Recent work[1], [2], [3] on prehistoric dates and climatic conditions indicate that this part of Kansas was rather uninhabitable between 1226 B.C. and about 520 A.D. on account of a cool rainy period

[1] The Correlation of Time Units and Climatic Changes in the Peat Deposits of the United States and Europe. Alfred P. Dachnowski, Proc. Nat. Acad. Science, Vol. 8, No. 7, p. 225.

[2] Quaternic and Tertic Chronology. Vernon C. Allison, The Pan-American Geologist, vol. XLII, No. 3, October, 1924, pp. 199–217.

[3] The Antiquity of the Deposits in Jacob's Cavern. Vernon C. Allison, Anthropological Papers of the American Museum of Natural History, Vol. XIX, Part VI, pp. 297–335.

followed by a cold windy climate; since about 520 A.D. the climate has been substantially the same as at present. The period from 1226 B.C. to about 520 A.D. corresponds to the Lake Border Glaciation episode of North America, the Fini-Glacial of Scandinavia, and the Daun Glacial episode of the Alps. Another preceding uninhabitable period extended from 16,080 B.C. to about 12,000 B.C. (The Port Huron Glacial episode of North America, the Goti-Glacial of Scandinavia, and the Gschnitz Glacial episode of the Alps); the climatic conditions of the intervening period, from about 12,000 B.C. to 1226 B.C., were similar to those of today and thus southeastern Kansas was inhabitable. By using these climatic and chronological data together with Thoburn's estimate of the successive migrations since about 520 A.D., it is possible to construct an approximate prehistory for Crawford County, Kansas:

Inhabitants	Period
White Settlers	1800–1850 A.D. Onward
Siouan stock	1350 A.D. to 1800 A.D.
Caddoan stock	900 A.D. to 1350 A.D.
Iroquoian ?	520 A.D. to 900 A.D.
Sparsely Inhabited	1226 B.C. to 520 A.D.
Inhabitants ?	12000 B.C. to 1226 B.C.

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A PRIMITIVE PUEBLO CITY IN NEVADA

By M. R. HARRINGTON

THE fact is well known that at an early period agricultural tribes of Indians, building rather primitive houses but manufacturing pottery of Pueblo types, were widely scattered over the Southwest. But it is also true that comparatively little attention has been paid to them hitherto, perhaps because the remains of their relatively humble habitations seem so insignificant when compared with the spectacular cliff-dwellings and with the huge stone and adobe buildings left by Pueblo peoples in much later, but still prehistoric, times.

For this reason the work done during two seasons by the Museum of the American Indian, Heye Foundation, in cooperation with the State of Nevada, in the veritable city of adobe ruins and pit-dwellings near St. Thomas, Nevada, may prove of special interest; for it may shed some additional light on that remote period of Pueblo prehistory when the characteristic culture was just beginning to take form and Pueblo architecture was born.

The group of ruins has been officially named "Pueblo Grande de Nevada," but the press and the public at large prefer to call it the "Lost City," and under this name it now appears on the Union Pacific railroad maps.

The writer was in charge of this expedition, with Mr. C. O. Turbyfill, also of the Museum staff, as first assistant, and with Mr. Louis Schellbach, 3d., representing the State of Nevada. Among the others who rendered efficient service were Messrs. George and Willis Evans, father and son, from the Pit River tribe of northern California; Mr. Fay Perkins of Overton, Nevada, and Mr. Leslie Sanchee, a Zuni. Not only did Governor Scrugham and the State authorities in general exert themselves to assist us in every possible manner, but many of the neighboring ranchmen and other residents of the Moapa valley went out of their way to help us, and our thanks are due to all of them.

Pueblo Grande seems to have been the largest Puebloan settlement in the State of Nevada, but it is by no means the only one, for there are numerous similar though smaller house-groups scattered here and there along the Muddy and Virgin valleys, and reconnoissance has shown that remains of this kind are quite widely distributed in the eastern part of the state over an area approximately 250 miles long from north to south, and some 80 miles wide from east to west at the widest point thus far observed. To the southwest we have already traced the culture to within fifty miles of the California line, and strongly suspect that it will yet be found within the limits of that state.

Returning to Pueblo Grande, we find the traces of ancient dwellings scattered along the east side of Muddy river from a point just above its junction with the Virgin river northward for five or six miles. In the flat land of the valley many ruins have been destroyed by ranchers in leveling the ground for cultivation, but a large number still remain, for the greater part more or less buried under mound-like sand-dunes covered with a thick growth of scrub mesquite; and the eroded remains of other houses dot the tops of the low ridges lying between the valley proper and Mormon Mesa to the east. Whether in the valley or on the ridges, the houses are thickly scattered in some places, thinly in others. At the widest, the old settlement probably did not measure more than a mile; in most places much less. Forty-six of the houses have already been thoroughly, and a number more partially, explored; but this is but a small part of the total.

It was soon found that there had been several types of houses occupied by the same people, the most primitive of which was the *pit-dwelling* proper. This is a circular or oval pit, eight or ten feet across and three or four feet deep, with a floor of hard-beaten earth or of adobe, with the sides of the hole plastered with the same material and usually with a circular bowl-shape fireplace a little to one side of the center. In some of these, possibly the oldest, the walls above the ground level and the roof must have been made of poles covered with mats, or some other perishable stuff, for these pits contain nothing in the way of adobe, stone, or other fallen wall material.

Of more advanced type and more common here is the pit-dwelling with an encircling wall of adobe, or adobe and stone; the pit, in this case, yielding the remains of the fallen wall.

In some places there are isolated pit-dwellings, in others whole groups placed in a more or less haphazard way; in still others the pits were arranged in a row, side by side, with a little space between.

And it was from rows of pit-dwellings like this that true houses seem to have developed, when some enterprising pit-dweller conceived the brilliant idea that he might make a single party-wall answer for two adjoining pit-dwellings, simply by digging them close together and making the intervening wall straight instead of curved; but the true rectangular room seems to have come later. In most of the houses the rooms remain more like ovals cut straight across at the ends, than like rectangles—that is, the end walls only are straight, while the side walls remain curved to a greater or less extent, and the floors are still more or less sunken below the surface of the ground.

In such manner seems to have been derived the idea of a many-roomed house; from this it was but a step to the building of houses with truly rectangular rooms in rows with floors on the level of the outside ground—and such houses were already being built before Pueblo Grande was abandoned. Thus true Pueblo architecture was born, for the great three- or four-storied houses which characterize the climax of the culture represent merely a further development of the same idea.

But even after this latest type of house was evolved, there were usually retained a few rooms of the old semi-underground style, a circular or oval, very likely in some cases as kivas for ceremonial purposes. That one at least was actually so used is suggested by the finding in it of fragments of painted sandstone slabs suggesting the altar tablets of modern Pueblo ritual.

The entrance to the original pit-dwelling was likely through a hatchway in the roof; but we found a number of examples in one of the more deeply buried and hence better preserved houses which showed small lateral doorways, in the portion of the wall projecting above the ground when the house was in use with

PLATE XXXV.

(A) House #47, Pueblo Grande de Nevada, looking east.

(B) Corner of a room showing alternate courses of adobe and stone used in construction, Pueblo Grande de Nevada.

PLATE XXXVI.

(A) A row of rooms, House 46, Pueblo Grande de Nevada, showing fireplace and step in first room.

(B) A detached room showing doorway, Pueblo Grande de Nevada.

stone sills about on the ground level, Plate XXXVI (B); and in one case a stone lintel was still in place.

These particular pit-dwellings with doors were all associated with a house possessing many rectangular rooms, and so may belong to a type later than the original style having only a hatchway in the roof. We surmise that there *was* an original style with such a hatchway, not alone from the known wide distribution of entrances through the roof in structures of this sort, but because we found in some instances thin flat slabs of stone worked around the edges, which would seem to have been serviceable only as hatch covers. And from the fact that such covers were found also in the ruins of rectangular rooms it seems probable that these too were often entered through the roof.

Interior doors between rooms were found but rarely during the course of our work; but it must be remembered that early Pueblo doors were more often like modern windows, the sills raised some distance above the ground, and it is possible therefore that our remnants of walls at Pueblo Grande do not as a rule extend high enough to show such interior doorways.

Even when the walls have been eroded down below the level of the sills, however, the former position of an outside door can frequently be located by the presence of a step at the side of a sunken room, Plate XXXVI (A)..

These steps, by the way, possess an interest all their own on account of the resemblance of some of them to the so-called fire-screens found in kivas of presumably much later date. Generally speaking, a step is a structure about a foot high and a foot or less in length and thickness, set on the floor of a room between the fireplace and the wall nearest the courtyard. Always they are nearer to the wall than to the fire-place, sometimes actually touching the wall and continuous with it. Some of these steps are built of stone and adobe, others are simply squarish single stones or slabs set on edge in the floor. And it is the slab type of step that resembles most the kiva "fire-screen." From their position and from the evidences of wear seen on the tops of the steps there seems to be little doubt that they were actually used for this purpose—to facilitate stepping down into a sunken

room. Steps are usually found in the larger rooms, particularly those of wattle-and-daub type, but may occasionally be seen in rectangular rooms with solidly built walls.

In a few instances portions of a fallen roof have been preserved by charring, and these show stout round beams across which were laid slender sticks, quite close together, while upon these again was spread grass or rushes, with adobe over all.

Floors were usually of adobe plaster, or of flat stones roughly fitted together; but sometimes we found the stone floor plastered over with adobe, making a combination of the two, and occasionally the floor was merely the bare, hard-beaten earth.

The typical fireplace was a shallow bowl-shape depression, sometimes with a raised rim, set to one side of the center of the room, Plate XXXVI (A); but corner fireplaces with raised adobe or even stone rims were sometimes seen. Sometimes little bins made of adobe or a combination of slabs set on edge and plastered with adobe appeared in the rooms, usually, like one type of fireplace, in the corners. Fireplaces seldom occur in the smaller rooms, which were probably used as storage places and bedrooms only.

Besides the small shallow interior bins just mentioned, there are larger ones of adobe and stone built up against the outside walls of the houses, some of them holding several bushels; while even larger were granaries, constructed like miniature pit-dwellings apart from the main building. Some of these, however, had been almost entirely subterranean, with roofs at the then ground level; and one of them had a sunken entrance-way on one side, walled with upright slabs to keep the sand from caving in.

Turning to the construction of the walls, we found some of them built of loaf-like hand-shaped adobe bricks plastered inside and out with adobe, but most seem to have been made of long masses of adobe, laid on the wall in a more or less plastic condition and plastered over later. Occasional walls were built of alternate courses of adobe and flat stones of suitable size rather neatly laid, Plate XXXV (B); but in other cases stones were inserted at random among the adobe masses or bricks, the only cae beingr to turn a flat face inward if the stone was large, so that it would be flush with the inner surface of the wall.

Many of the larger rooms showed an interesting type of wall construction—adobe and stone mixed, strengthened and supported internally by imbedded mesquite or screw-bean poles, or bundles of willow sticks, or both—if we may trust the imprints still remaining in the adobe. Most of these walls were crudely finished, and in one case at least, had sloped inward like the wall of a wikiup. In other instances such walls had evidently been vertical, but had not been strong enough to support so large a roof, for which purpose extra posts had to be placed at more or less regular intervals along the inside of the wall, posts now marked only by holes in the adobe floor. This pole-and-mud type of construction we characterized as "wattle-and-daub" although it differs somewhat from the type usually so called, and it is similar to, if not identical with, a type of structure found by Judd in western Utah.[1] There were also occasional floors with fireplaces, but without evident traces of substantial walls. These may represent arbors or partly open shelters; or the walls, originally of wattle-and-daub or of adobe without stone admixture, may have been entirely destroyed by decay and erosion.

Baseboards of stone slabs set on edge are sometimes seen at the base of the walls inside the room, especially when the room is semi-subterranean. The former height of the walls is problematical, for all that remains of them now is usually only a few inches in the upland houses, which were subjected to much erosion, and two or three feet in the valley ruins which were more or less protected by drifting sand. We can be reasonably sure that the buildings were only one story high, for the thickness of the walls—only five to eight inches—is not enough to support the weight of a second story, not to speak of a third or a fourth.

Most of the rectangular rooms with solidly built walls are very small, such sizes as four by six feet being not at all uncommon; a few are even smaller, and could have been used only as

[1] See Judd, Neil M., Archaeological Reconnaissance in Western Utah, Smithsonian Misc., Coll., LXVI, no. 17, Washington, 1917; Notes on Certain Prehistoric Habitations in Western Utah, Proc. 19th Int. Cong. Americanists, Washington, 1917; Archaeological Investigations at Paragonah, Utah, Smithsonian Misc., Coll., vol. LXX, no. 3, Washington, 1919; Evidence of Circular Kivas in Western Utah Ruins, Am. Anthrop. (N.S.), Vol. 19, no. 1, Jan.-March, 1917.

closets or granaries. In the part of the Pueblo explored by us, the kiva-like pit-dwellings were never more than ten or twelve feet in diameter. Largest of all types of rooms were those with wattle-and-daub walls, and oval or rectangular form, usually with floor slightly sunken below the ground level. One of these, the one with the in-sloping walls, measured approximately ten by fourteen and a half feet, and this was the largest room found.

Possibly the small size of most rooms may be explained by the lack of long poles for roof-beams, for at another site, on the Colorado river at the mouth of the Virgin, where long drift-wood logs are abundant, we found a kiva-like structure about thirty feet in diameter.

Many of the houses consist of one room only; others were of three or four rooms; but large houses composed of from eight or nine to twenty or thirty rooms are of frequent occurrence. In such cases the rooms are usually arranged in a semicircle or horseshoe form about a court, Plate XXXVI (A), with the opening southward; but we have one example thus far of construction about a rectangular court, and one of an oval court, almost completely inclosed.

The largest house, Plate XXXV (A)—the one we were exploring when the work of the expedition came to a close, must have contained nearly a hundred rooms, for it was about two-thirds uncovered when the work ended and sixty-three rooms had already been found, arranged around two principal, approximately circular courts.

In the larger houses we usually find various evidences to prove long occupancy—deep deposits of refuse in the courtyards, built up, layer on layer, sometimes to a depth of seven feet; large peripheral ash-dumps; and, most interesting of all, abundant evidence of houses being built and rebuilt on the same ground, indicated by the floors and walls of older buildings underlying those of later structure, these often built with an entirely different ground-plan. In the largest house three different levels can be distinguished, and there may be more.

Our collection of artifacts illustrating the industries of the ancient people come from three sources—from the ruined rooms,

(A) A skeleton with pottery, Pueblo Grande de Nevada.

(B) Pitcher of red-ware with designs in black, Pueblo Grande de Nevada.

PLATE XXXVIII.

(A) Painted Bowls, Pueblo Grande de Nevada.

(B) War-club of Elk-antler, Pueblo Grande de Nevada.

from the refuse deposits in courtyards and ash-dumps, and, most important of all, from the graves of the dead. I say most important, for in these graves appear objects in perfect condition of which fragments only can be found elsewhere.

It seems to have been a fixed custom to bury in ash-dumps and in ruined houses, and this, in this region at least, could not always have been because such places were easiest to dig in. It seems at least possible that the old people had a horror of leaving their departed friends away from the signs of human habitation: much the same spirit as is expressed in the old cowboy ballad, "Oh Bury Me Not On The Lone Prairee." Burials often appear below room-floors, but in no case thus far found has the floor been relaid over the grave, and in many instances the outlines of the grave can be traced through the fallen wall material filling the room—the first a good sign that the room had been abandoned, the last a sure sign that it was in ruins when the interment was made. In other cases there was plain evidence that the roof had been burned and the walls thrown down *after* the interment.

The skeletons always lie in a flexed position, Plate XXXVII (A), and no cremations have been encountered thus far. The mortuary offerings are varied-pottery of varying types, implements, and ornaments; while sometimes even dogs were buried with the dead. Naturally articles of perishable material have largely disappeared, but in some well-protected graves we have found crumbling fragments of coiled baskets, bits of blankets of fur-cloth and feather-cloth, and many pieces of fine woven fabric, undoubtedly cotton, including sections of narrow bands in two colors.

It will not be amiss, in view of the widely disseminated newspaper stories of a "race of giants," to state here that the stature of the inhabitants of Pueblo Grande de Nevada seems to have been slightly below the average of Pueblo Indians today. Some of the skulls show artificial occipital flattening, others not.

Most abundant of all the evidences of man's handiwork, outside of the ruins themselves, is the pottery, of which thousands of fragments may be found in and about the ancient habitations. Occasionally all the pieces of a vessel may be found in a room, but as a rule we must depend on the graves for whole or restorable vessels.

The pottery may be classified under several heads. Most abundant is the plain ware, taking the form of cooking-pots, water-ollas, canteens, long-necked bottles and bowls, with a few odd forms such as the duck-effigy bottle, of which two were found. Plain ware occurs in all the houses of whatever type; the quality varies from crude to fine, and the color from black to gray.

Taking the settlement as a whole, corrugated ware comes next in point of abundance, although it is scarce in the more southerly houses of the pueblo. One type of corrugated, in which the coils are left to form a decorative band on the neck of the otherwise smooth vessel, although not very abundant, occurs everywhere, and a rather crude notched type of corrugated is widespread.

In the more northerly houses thus far explored, however, beautifully made, carefully notched or waved corrugated ware is abundant, and there also occur some bowls neatly corrugated on the outside, and painted black-on-gray or black-on-white inside. The typical vessel here is a cooking-pot, the body decorated with notched corrugation and the neck with plain straight coils; but corrugated canteens, bottles, and bowls occur, also vessels embellished with alternate bands of straight and waved corrugation, Plate XXXIX (A).

Apparently beginning at an early period, and doubtless lasting to the end, for it is found everywhere in the pueblo, and at all levels, is the ware we call black-on-gray, which usually takes the form of bowls, or, very rarely, ollas, painted with geometric designs laid directly upon the clay composing the vessel, without the previous use of a white slip. The decorations are confined to the inside of the bowls, and vary from crudely executed designs in thin, irregular black strokes to beautiful and intricate patterns composed of broad, even lines, Plate XXXVIII (A).

An improvement on this type is the black-on-white, not so abundant, and found only in the form of bowls; in this the neat decoration in black is applied over a white slip. A kind of intermediate form between this and the last is a ware that is black-on-gray in color, but the gray seems to be a slip, applied like the white, and not the natural color of the pottery.

Scattered almost everywhere, especially about the houses of more advanced type, are occasional fragments of black-on-red ware, of which four forms have been found complete—the bowl decorated inside, the gourd-shape vessel, the pitcher, Plate XXXVII (B), and the jar, the last three, of course, decorated on the outside. The black sometimes has a glossy appearance little short of a glaze, and the red ground-color is often particularly rich and pleasing.

No description of the pottery found here would be complete without mention of the crude, coarse, crumbly, black or dark-brown pottery found on camp-sites along Muddy and Virgin rivers, sites which show no ruins or remains of habitations whatsoever. When decorated at all, this ware shows merely lines of curved imprints made with the finger-nail; while in form the vessels seem to have been more or less conical, with pointed bottoms.

This pottery is usually so much cruder and more irregular than the poorest Pueblo product that it can be distinguished at a glance. But the student who imagines it to be older than the Pueblo varieties on account of its more primitive and undeveloped character would be making a serious error in this case, for when found on Pueblo sites it appears only on the surface or not far below, and some of the camp-sites yielding it show also iron, glass, and china. In short, this crude ware was made by the Indians found in possession of the region by the Mormon pioneers —the Southern Paiute; and these Indians claim that it was still being made as late as the nineties.

Occasional sherds of Mohave ware may also be picked up along the Virgin, and on one camp-site fragments of a type of pottery, plain, with very thick rims, which seems to differ from all the rest.

It is not necessary here to enter into a detailed description of the flintwork found at Pueblo Grande de Nevada, for the arrowheads, etc., though well made, are not distinctive in any way.

Attention should be called to the fact, however, that grooved axes, such as were used extensively by the Pueblos of later periods, are entirely absent here—in fact no axes of any kind have been found. A few long pebbles with an axe-like edge chipped at one end, and one notched hammer of the type used at the

ancient salt mines about six miles from the pueblo, are the nearest things to axes thus far discovered.

The metates are crude, and much like the type used until the present day by the Plateau tribes; manos occur in many forms and stages of elaboration; rude pestles are sometimes found, and mortar-holes in the bedrock are frequent about the upland houses. Griddle-stones appear occasionally, usually in a broken condition. The hatchcovers have been mentioned.

Under the general classification of stone objects may also be included pendants and crude animal figures of selenite, minute beads of steatite, and both pendants and beads of turquois. There were, moreover, tubular smoking-pipes made of stone.

Animal bones of any sort are rare here, for some unknown reason, and implements of bone even rarer; but we have been able to procure several forms of awls made of this material, and some cylindrical objects likely used in chipping flint. The most interesting bone object found was a tubular pipe, which I think is unique; the stem is made of some compact bone, but the bowl is made of porous bone, coated with clay. Next in point of rarity is a large war-club of elk-antler, Plate XXXVIII (B), carefully worked and finished, which we regarded at first as an intrusive form; but since the close of the expedition Mr. Schellbach has found several similar clubs in another ruin farther up Muddy river.

Also of considerable interest are bone dice of two types, circular and oval. Both are coated on the reverse or concave side with pitch or asphaltum, and the oval dice often bear incised geometric patterns on the obverse side. Quite characteristic also are flat, more or less irregular, pieces of deer or mountain-sheep leg-bone, averaging two inches long, all perforated at about the center, as if for suspension. There are no turkey-bones, nor objects made from them.

Olivella shells from the Pacific served in the manufacture of beads of several types, while abalone and some massive, solid, white marine shell furnished material for pendants.

Little can be added to what has already been said with regard to textiles and the like, except that a small cave situated in the edge of the pueblo and yielding typical Pueblo pottery furnished

us also with some dyed cotton strings of red and blue and purple, and one piece of blue cotton cloth, somewhat like modern cheese-cloth in texture; and that some of the crumbling fine cloth found in graves was still purplish until paraffin was poured upon it.

The best preserved, if not the finest, textiles accompanied two remarkable burials which had been placed in soil naturally strongly impregnated with salt, on the crests of ridges where the drainage was good, and which possessed the added advantage of being sealed above with a rain-shedding crust of adobe. In one case large pieces of the cotton breech-clout could be preserved in fairly good condition, as well as sections of the girdle which supported it—a girdle made of numerous cotton strings loosely twisted together; while the second, a child, was enveloped in a fur-cloth robe the foundation cords of which were still in fair condition, although the fur had disappeared. This had been tied about the body with fiber cords and one of the flat woven cotton bands in two colors; while about the head was found a fringed fillet made of cords. Something about this salt impregnating the soil was especially favorable to the preservation of vegetal fibers, but not other things; for although the textiles, including basketry, were uncommonly well preserved in these two graves, the bones and the pottery were more disintegrated than usual.

Speaking of baskets it should be said that traces of them were seen in many graves; but only in rare instances was any part of a basket sufficiently substantial to preserve. All were coiled, that much could be easily seen; but whether or not there had been interwoven decorative patterns we were unable to determine. One example, however, had been ornamented with painted patterns laid on so heavily that design and color survived after being uncovered just long enough for a sketch to be made—and then basket, pattern, and all crumbled to dust.

The exploration of the ancient caves used as salt mines, Plate XL (B) which also contained Pueblo pottery and belong, in part at same period, yielded strings of yucca-fiber, Indian hemp and least, to the cotton, all of natural color, a bunch of cotton strings dyed deep red, and one string only dyed yellow. Strings from feather- and fur-cloth blankets were found here in good condition, but the

most complete articles of this character were a netting bag made of Indian hemp strings (Fig. 1,) and several sandals of yucca-fiber. These have pointed toes, and are distinctly Pueblo in type, although differing somewhat in detail from any footgear I have seen (Fig. 2).

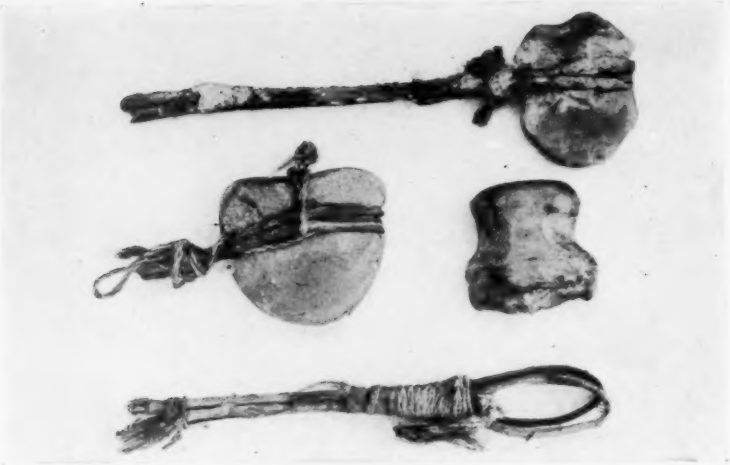
FIG. 1. Netting bag found in salt cave.

From the salt caves also came a few objects which may represent a culture older than that of Pueblo-Grande,—that of the Basket-makers. These were a fragment of a typical Basket-maker carved club, and two or three fragments of atlatl spears. Of course these may have been survivals from an earlier day in Pueblo Grande or one of the related villages, from which they somehow found their way into the caves. However it is certain that the typical weapon of Pueblo Grande was the bow and arrow rather than the atlatl, for true arrowheads are abundant; and in one grave were actual fragments of cane arrows, which we succeeded in preserving with melted paraffin. Moreover, negative evidence is furnished by the fact that points suitable for atlatl spears were *not* found in the ruins, the only spear-point appearing within the limits of the pueblo being picked up on the surface some distance from any house.

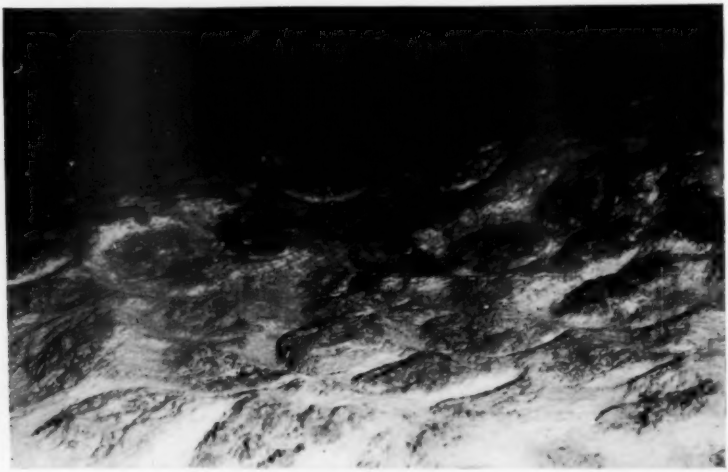
(A) A corrugated pot *in situ* Pueblo Grande de Nevada.

(B) A salt peak, site of ancient salt-mines near Pueblo Grande de Nevada.

PLATE XL.



(A) Stone hammers with original wooden handles. Ancient salt-mine near Pueblo Grande de Nevada.



(B) Salt ledge forming floor of ancient mine showing markings made in quarrying salt. Near Pueblo Grande de Nevada.

The finding of a notched hammer-head in the pueblo has already been mentioned. In the salt caves we found hundreds of such hammer-heads, used in mining the salt, Plate XL (B), together with roughly chipped picks and choppers. And we were fortunate enough to secure a number of the stone salt-ham-

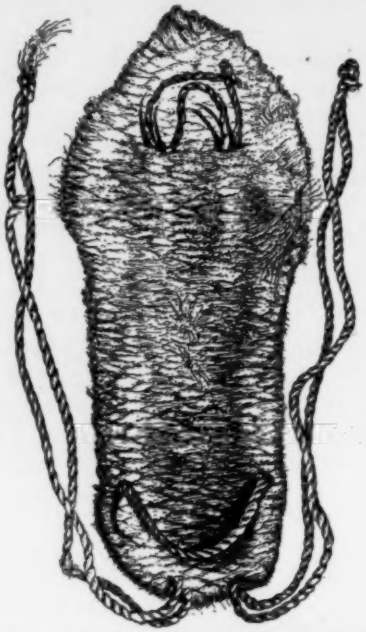


FIG. 2. Sandal of yucca fiber found in salt cave.

mers still provided with their original wooden handles, each hammer showing two or three thin, limber sticks bent around through the notches to form the handle and wrapped together with yucca-fiber string, Plate XL (A).

Turning to the foods of the ancient people as evidenced by our collections, we must conclude first of all that they placed little dependence on animal foods, if we may trust the scarcity of animal bones in the refuse-heaps. Still, the bones of most of

the native animals appeared, such as the deer, the mountain-sheep, the rabbits, the desert turtle. On the other hand, large quantities of charred corn and corn-cobs tell of their dependence on agriculture, while beans and squash seeds give some idea of its variety. Charred mesquite-beans, screw-beans, and unidentified seeds show that the natural products of the desert were not neglected.

As for our conclusions, there has been no time for extended comparisons, so any conclusions formed must be regarded as tentative.

Taking it all and all, the culture seems more like that found by Judd at Paragonah, Utah, than anything else of which I have read published accounts. There are, however, important differences. For example, Judd found mostly rectangular rooms, grouped about rectangular courts, in which were a very few circular, semi-subterranean rooms, apparently kivas; while at Pueblo Grande the courts are semicircular as a rule, and although we find many rectangular rooms, and circular chambers which may have been kivas, there are also numerous circular, semi-subterranean structures—sometimes whole groups of them—which were undoubtedly living-rooms—true pit-dwellings and *not* kivas. In addition Judd found hogan-like dwellings northeast of Great Salt Lake, containing Puebloan pottery; and again at Beaver City, Utah, where they overlaid typical rectangular adobe rooms, while we have found no such habitations whatever. Various other differences might be cited.

On the whole, Judd's Paragonah ruins seem to show a higher state of development than ours and quite possibly represent the same culture at a somewhat later time.

We are not ready yet to state with certainty the exact position of Pueblo Grande in the scheme of Southwestern chronology; and the case at present looks somewhat more complicated than it did at first. Our first hypothesis, that Pueblo Grande exemplifies the transition period between the Pre-Pueblo and Early Pueblo Periods as defined by Kidder, was shaken by Kidder himself after he had examined our finds. Judging by these, he thinks, we have instead a progression from the Post-Basket-maker stage

directly into the Early Pueblo, omitting entirely the interveining Pre-Pueblo stage which occurs farther east.

This opens an interesting field for speculation. Did the Post-Basket-Maker culture survive longer in this western peripheral region, after it had given way, farther east, to the influences which produced the Pre-Pueblo and then the Early Pueblo cultures? If so, when the Early Pueblo began to blossom forth, perhaps it then spread westward across the Colorado River to the still surviving Post-Basket-Maker villages on the Virgin and the Muddy, where it stimulated their people to new achievements. And this would account for conditions as we find them at Pueblo Grande de Nevada.

MUSEUM OF THE AMERICA INDIAN,
HEYE FOUNDATION,
NEW YORK CITY.

MAYA INSCRIPTIONS: STELA C AT COPAN

By JOHN E. TEEPLE

STELA C at Copan shows the Venus sign in Glyph 3, has the date 18 Kayab, and so has been supposed to have some relation to the calendar or movement of the planet Venus. Beyond this, however, the relationship of the calendar round dates given has been largely guesswork, and the guessing has usually been wrong. Now that we know the system of the Venus calendar,[1] I think we can at least indicate just what relation the various dates bear to one another and to the calendar. As explained previously, the perpetual Venus calendar consisted of a series of Zero dates, each calendar beginning with a 1 Ahau Zero date and extending over 57 or 61 Venus years, nearly two calendar rounds. The Zero date most often referred to in the inscriptions, because it was the one in use throughout the whole great period, was 1 Ahau 18 Kayab, that calendar extending from 9.14.15.6.0 to 9.19.7.14.0. Normally, at the end of any sixty-first Venus year, which should end at 5 Kan, Venus itself has dropped behind about 4 days, so 4 days are deducted from 5 Kan, giving a new 1 Ahau Zero date and starting a new calendar. It is probable that every fifth calendar was only 57 Venus years in length, and every sixth Zero date was dropped entirely. Since 1 Ahau can occupy 73 positions in the Mayan year, there would be 73 possible Zero dates before repetition occurs. 4 Ahau always ends the tenth Venus year of the calendar, 5 Ahau the thirty-fifth, and 6 Ahau the sixtieth. Some of the Zero dates in the series would be as follows:

1—7.16.17.13.0	1 Ahau	18 Kayab	In the thirteen cycles before 4 Ahau 8 Cumhu
26—12.19.9.10.0	1 Ahau	18 Ceh	
27—Omitted			
28—13.4.2.0.0	1 Ahau	3 Pax	
33—Omitted			

[1] John E. Teeple, Maya Inscriptions, The Venus Calendar and Another Correlation, AMERICAN ANTHROPOLOGIST, Vol. 28, No. 2, April–June 1926.

34—1.8.10.4.0	1 Ahau	13 Yaxkin
35—1.13.9.3.0	1 Ahau	8 Cumhu
36—1.18.8.2.0	1 Ahau	18 Yax
67—8.5.8.3.0	1 Ahau	13 Muan
72—9.4.17.8.0	1 Ahau	13 Kankin
73—9.9.16.7.0	1 Ahau	3 Yaxkin
1—9.14.15.6.0	1 Ahau	18 Kayab
2—Omitted	(1 Ahau	8 Yax)
3—9.19.7.14.0	1 Ahau	18 Uo
4—10.4.6.13.0	1 Ahau	13 Mac
5—10.9.5.12.0	1 Ahau	3 Xul

The above will cover about all the Zero dates used in the inscriptions and the Codices. With the above Tables before us we can now date in the long count the various calendar round dates given in the inscriptions of Stela C, choosing for each one the period when that date ended a Venus year, with the following results:

	1—8.1.15.1.0	6 Ahau	18 Kayab	In the thirteen cycles before 4 Ahau 8 Cumhu
	2—8.10.5.9.0	6 Ahau	13 Muan	
	3—1.14.5.7.0	4 Ahau	8 Cumhu	
or	3a—1.16.5.17.0	5 Ahau	8 Cumhu	
	4—10.0.4.0.0	4 Ahau	18 Uo	
	5—10.2.4.10.0	5 Ahau	18 Uo	

The date of the monument itself is given as 4 Ahau 18 Muan, and this has been decided on artistic and other grounds to be 9.17.12.0.0 4 Ahau 18 Muan. Now, at that date Venus was probably the most conspicuous object in the evening sky, less than 36 days from conjunction and 40 days from the end of the Venus year at 9.17.12.2.0.5 Ahau 18 Kayab. The author of the inscription accordingly took the opportunity to give a lecture on the Venus calendar, particularly in its relation to 4 Ahau, 5 Ahau, 6 Ahau, and the months Muan and Kayab, after the custom of the Maya writers.

The reason for the interest in 4 Ahau and Muan, and in 5 Ahau and Kayab, is obvious; but why the interest in 6 Ahau? This becomes clear when we recall that the current 18 Kayab Venus calendar is a short one of only 57 years, and consequently there will be no sixtieth Venus year ending in 6 Ahau 18 Kayab in the current calendar. With this in mind the scribe computes

the last time that a 6 Ahau 18 Kayab ended a Venus year, nearly six thousand years before, and also the last time any Ahau ended a Venus year in a Muan calendar. This computation covers the first side of the inscription.

A free translation of the understandable part of this inscription on Stela C would be about as follows:

"Thirteen calendar rounds after the last 6 Ahau 18 Kayab which ended a Venus year (8.1.15.1.0 previous Great Cycle) and 11.14.5.1.0 after that resulting 6 Ahau 18 Kayab (9.16.0.8.0 previous Great Cycle) was 6 Ahau 13 Muan (8.10.5.9.0 which ended a Venus year) which was a day of a new moon and which ended a moon group, etc."

The other side of Stela C apparently reads about as follows:

"Thirteen calendar rounds (from the well known 4 Ahau 8 Cumhu at 13.0.0.0.0 was 4 Ahau Cumhu (1.14.5.7.0 ending a Venus year). The next time after the present, when 4 Ahau will end a Venus year will be at 4 Ahau 18 Uo (10.0.4.0.0) which ends a Tun. This is so because the Yax Zero date which you would expect (1 Ahau 8 Yax) will be omitted. The next 5 Ahau ending a Venus year (after this 5 Ahau 18 Kayab one that is just before us) will be at 5 Ahau 18 Uo (10.2.4.10.0). This monument was erected on 4 Ahau 18 Muan (9.17.12.0.0)."

Left Side:

In the 13 cycles before 4 Ahau 8 Cumhu	8.1.15.1.0	6 Ahau 18 Kayab ended a Venus year.
	1.14.5.7.0	13 calendar rounds added.
	9.16.0.8.0	6 Ahau 18 Kayab significance unknown.
	11.14.5.1.0	
	8.10.5.9.0	6 Ahau 13 Muan ended a Venus year, was a new moon, and ended a moon group.

Right Side:

	13.0.0.0.0	4 Ahau 8 Cumhu
	1.14.5.7.0	13 calendar rounds added
	1.14.5.7.0	4 Ahau 8 Cumhu ended a Venus year.
or,	13.2.0.10.0	5 Ahau 8 Cumhu
	1.14.5.7.0	13 calendar rounds added
	1.16.5.17.0	5 Ahau 8 Cumhu ended a Venus year.

10.0.4.0.0	4 Ahau 18 Uo ends a tun and is the next 4 Ahau to end a Venus year.
9.19.14.5.0	1 Ahau 8 Yax omitted as a Zero date.
10.2.4.10.0	5 Ahau 18 Uo is the next 5 Ahau to end a Venus year.
9.17.12.0.0	4 Ahau 18 Muan, Date of the monument.

Of course a good many of the hieroglyphs are still entirely unknown, but I think the above gives a general trend of the inscription. Since any given date like 1 Ahau 18 Kayab as the end of a Venus year can only recur at intervals of 14.17.17.11.0, which is about 6000 years, there is not much difficulty in placing such a date in the long count. The starting glyph on each side of the Stela which has been variously interpreted as 13 cycles, 13 great, great cycles, etc., is here taken to mean 13 calendar rounds.

We cannot furnish proof that these readings are correct but the following points should be noticed:

First: These readings and explanations are quite independent of any correlation between Maya and Christian chronology, and are based only on Maya data.

Second: Aside from the date of the monument there are seven dates given. Six of these seven fall into their places in the Venus calendars just as we should expect in such a discussion as the priest is giving. The single exception is the second 6 Ahau 18 Kayab whose significance is unknown. Possibly he desired to show that 4 Ahau 8 Cumhu ended a Venus year just 13 calendar rounds after the great 4 Ahau 8 Cumhu (or that 5 Ahau 8 Cumhu did just 13 calendar rounds after the corresponding 5 Ahau 8 Cumhu), and then he made the same addition to 6 Ahau 18 Kayab for the sake of symmetry.

Third: As so arranged, 6 Ahau 13 Muan ending a Venus year would fall on a new moon day according to Maya reckonings as the inscription says it does; and 4 Ahau 18 Uo ending a Venus year would also end a tun as the inscription notes.

Fourth: Altar W′ Copan gives date 9.17.5.9.4 just 40 days before the end of a Venus year, the same as Stela C does, and Stela 1 Los Higos gives a date 9.17.10.7.0 just 36 days before the end of a Venus year. Both of these are accompanied by Venus

signs and apparently are an attempt to record Venus at its greatest brilliancy.

Fifth: The reading of the glyph as 13 calendar rounds was what first led the writer to see that Stela C was a summary of the Venus calendars. There is probably not sufficient evidence to warrant one in insisting on this reading. Possibly the first appearance of the glyph refers to the previous 13 cycles, and the second one to the present 13 cycles, but whatever meaning is given to this glyph does not seriously affect the interpretation of the inscription as a whole.

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MAYA INSCRIPTIONS, IV

By JOHN E. TEEPLE

IN RECENT articles I attempted to work out a method of correlating Maya and Christian chronology entirely from pre-Columbian sources. This work resulted in three or four possible dates, but the best one, both in its astronomical agreements and in its relation to the Maya dates of Spanish times, made November 22, 504 of our Julian Calendar equal to Maya date 9.16.4.10.8, 12 Lamat 1 Muan. The method used is probably correct, but I do not see how we can consider the result itself as necessarily final. At the same time, this correlation will conform to the astronomical data available in the Maya inscriptions and codices while no other correlation that I have been able to find proposed by any other investigator will stand this test.

It is the purpose of this article to show briefly the nine steps of the argument by which the above correlation was reached, point out the strength or weakness of each step and attempt to bolster up some of the weak points.

1. The first step of the work consisted in determining the values of glyphs D and E of the supplementary series. At the time of publication a few of the series gave trouble, but further work has indicated that aside from the few late stelae at Quirigua only two monuments out of more than a hundred in all the Maya territory fail to conform to the solution offered; these two are Stela 3 at Tikal and Stela 1 at Piedras Negras. In the case of Stela 1 at Piedras Negras we have Stela 3 at the same city, with the same date and with a supplementary series that does conform to the others. The proof seems to be perfectly adequate and we can with confidence give the date of new moon in Maya figures with an error of not more than one day at any time between, say, 9.12.0.0.0 and 9.18.0.0.0.

2. Pages 51–58 of the Dresden Codex were long ago recognized as an eclipse table, but it was not specifically pointed out whether we were dealing with a table of solar or lunar eclipses. It must be

one or the other and could not be both. An examination of the eclipse dates showed several of them as much as 17 days distant from the conjunction of the sun with the moon's node. 13 days is about the limit for lunar eclipses, while as much as 18 would be possible for solar eclipses, so we may conclude safely that we have here a table of solar eclipses, and consequently the eclipse days are new moon days.

3. Given any series of 69 consecutive eclipse syzygies, it is possible to compute to a day the dates when the sun is in conjunction with the moon's node. Applying this method to the table we find that at the zero date 11 Manik an eclipse occurred at day 167 of the Tzolkin and the sun was in conjunction with the moon's node on day 166 of the Tzolkin. If we use the middle row of days in the table, then the eclipse and zero day was 12 Lamat day 168 of the Tzolkin and the conjunction with the moon's node was on day 167. We are safe, then in saying that, at the date when the table began, there was an eclipse just after the node conjunction, but not more than two days after it.

4. Next comes the question of a date for the beginning of the eclipse table. It must have a definite date and cannot be used over and over because, while the new moon dates would agree well enough for a while, some of the eclipses would not. The day of conjunction of the sun with the moon's node keeps receding in the Tzolkin and if one attempted to use the table for a second period several of the eclipses, such as numbers 12 and 35, for example, would drop out and be replaced by others one moon earlier. The date usually assigned to begin the table is 9.16.4.10.8 and, so far as new moon is concerned, we know this is a new moon day from the Maya monuments. The beginning date must be either 11 Manik or 12 Lamat and, aside from 9.16.4.10.8, there is only one other 11 Manik or 12 Lamat date on pages 51–58; this is on page 51-a in the first column but neither number in that column will reach 12 Lamat without a correction.

The fact that the cities Copan and Naranjo seem to have arranged the moon groups of the supplementary series in their later monuments in accordance with this eclipse table lends some support to the belief that 9.16.4.10.8 was an eclipse date and was the

zero date of this table. This question of date is, however, a weak link in the argument. While 9.16.4.10.8 is the only date given on the pages that could be the zero date of the calendar, I know of no way to prove that it was the actual zero date. Final proof on this point, it seems to me, must be deferred until someone identifies and deciphers an eclipse date somewhere in the inscriptions.

5. Pages 46–50 of the Dresden Codex and the computations on page 24 were identified as relating to Venus and the Venus calendar was fully deciphered by Förstemann 25 years ago. From the 3 calendars given on pages 46–50 of the Dresden Codex with zero dates of 1 Ahau 18 Kayab, 1 Ahau 13 Mac, and 1 Ahau 3 Xul, respectively, I was able to work out the complete succession of the 73 zero dates possible before a repetition occurs. Further examination showed that the 1 Ahau 18 Kayab calendar contained only 57 Venus years, that the next possible zero date, 1 Ahau 8 Yax was omitted entirely and that the usual Venus calendar contained 61 Venus years. Apparently the complete system called for 4 calendars in succession having 61 Venus years each, a fifth calendar of 57 Venus years and the sixth zero date dropped, a total series of 301 Venus years in 1.4.8.4.0, just 24 days less than the total would be if we computed each Venus year at 584 days. This is quite accurate. These series of 301 Venus years were supposed to revolve in endless succession and twelve of the series plus one calendar or one dropped zero date covered the whole cycle of 73 possible zero dates before a repetition occurred. This magnificent conception of a perpetual Venus calendar is clearly indicated in Stela C at Copan, but proof of the whole concept is not needed for our argument. We only need the mechanism in actual current use. I think there is abundant evidence in the cited pages of the Dresden Codex to show the sequence of zero dates of the calendars, the length of each calendar as 61 or 57 Venus years and the custom of omitting an occasional zero date (which of course was necessary after every 57 Venus year calendar, or vice versa, when a zero date was to be omitted, a 57 year calendar was necessary).

6. Given the system of Venus calendars and the sequence of zero dates we must still identify somewhere in the inscriptions

a statement of the end of a Venus year and so place some one zero date in the long count. Altar K at Copan seems to state clearly that a Venus year ended according to the calendar on 9.12.16.7.8, 3 Lamat 16 Yax. This would be the end of the 37th Venus year of the Venus calendar whose zero date was 9.9.16.7.0, 1 Ahau 3 Yaxkin, and the zero date of the calendar immediately following it would be 9.14.15.6.0, 1 Ahau 18 Kayab. Corroborative evidence was thought to be found in the Lintel of Temple C at Tikal, and other corroboration will be given below.

The weakness of this step is that it depends on the correctness of my readings of the inscriptions cited, and, if some experienced Maya scholar should dispute my interpretation of the hieroglyphs very little proof could be offered in rebuttal.

7. From the above combined data we can specify that on day 9.16.4.10.8 there was an eclipse of the sun. This eclipse was between 0 and 2 days after the sun was in conjunction with the moon's node. The node conjunction was probably between 19 and 24 days after an inferior conjunction of Venus. In a rigid examination of all dates this latter interval should probably be increased, say, to 15–28 to care for all possible fluctuations in the length of Venus years and this has been done in the present work. What dates satisfy the above conditions?

8. In any consecutive list of 65 recent Venus years, covering a period of over a century, not more than three will have inferior conjunction 19–24 days before node conjunction and not more than 5 within the 15–28 day limit. The same 3 or 5 will repeat during the next cycle within essentially the same limits, the variation being not over a day or two in a thousand years.

This relation of Venus conjunctions to conjunction of the sun with the moon's node restricts us to not over 3 or 5 days per century that are possible within our limits. The second relation however, that between node conjunction and eclipse, restricts us still further. If, for example, in a cycle of 65 Venus years, year number 4 meets our 15–28 day condition, and also is followed by an eclipse within 2 days after node conjunction, then in succeeding cycles the eclipse after number 4 will not fall within this two day limit again for over 1100 years. Hence we are safe in saying that

between the time of Christ and the year 1000 A. D. not more than five dates can possibly conform to the conditions we have deduced from the Maya records for day 9.16.4.10.8.

9. If we now conceive the Venus years between the time of Christ and the year 1000 A. D. as arranged in successive cycles of 65, beginning the first cycle anywhere B. C., and if we examine the years of a cycle for the 15–28 day relation, we may find for example that only years 4, 23, 42, 50 and 61 fall in or near our limits. We now examine year 23 by successive additions of a 65 cycle to it till we arrive at a date when the eclipse following year 23 falls in or near our 2 day limit and then pursue the same course with years 4, 42, 50 and 61. The method is probably cumbersome and the explanation somewhat labored, but when one is not an astronomer he must use whatever method and tools are available to him.

By this means six dates were found which seemed to meet the conditions fixed for 9.16.4.10.8 closely enough to warrant having accurate computations made regarding them. These were November 22, 504; June 6, 327; January 26, 548; May 16, 877; January 5, 1098; and December 14, 46 B. C. All dates are in the Julian Calendar, and all but the last are A. D. All six dates satisfy reasonably well the conditions we have imposed for 9.16.4.10.8, as to Venus conjunction, node conjunction and eclipse, and further it seems likely that no other date between say 50 B. C. and 1100 A. D. will meet the conditions.

If we could be sure that our conditions are fair and are justified, then one of these dates must represent 9.16.4.10.8. So far as our astronomical limits are concerned they are probably generous. If we were to use Willson's date 9.9.9.16.0, 1 Ahau 18 Kayab as the end of a Venus year instead of the one we have used, it would lead us still to at least four of the same six dates. So far as concerns the nine steps that lead to our set of conditions for Maya date 9.16.4.10.8, it seems probable that careful study will show at least seven of them as fully justified. The other two, numbers 4 and 6, may possibly be open to question. It seems probable in number 4 that 9.16.4.10.8 is the zero date of the eclipse calendar, but possibly it is not. Likewise 9.12.16.7.8 on

Altar K at Copan, in step number 6, probably shows the end of a Venus calendar year, but possibly it does not. If these two steps are correct we are probably committed to one of the six dates found for 9.16.4.10.8. If either of the two steps is in error, and some other reading should be found for Venus morning star or for the beginning of the eclipse calendar, then our six dates would probably be wrong, but the method would remain to be applied easily to the new readings.

Of these six dates for 9.16.4.10.8, which astronomically are almost equally good, I have selected November 22, 504 as probably most satisfactory for two reasons. First, because it most nearly coincides with the general period of time arrived at by Morley, Spinden, and others. Second, because the Maya chronicles of early Spanish times seem to agree in demanding a Katun 13 Ahau ending about 1540. Most of these chronicles agree that the Katun ended in 1536, some that it ended in 1539, and some 1542. Now the November 22, 504 date gives a Katun 13 Ahau ending in 12.9.0.0.0, 13 Ahau, 8 Kankin on February 22, 1545, while all the other five dates lead to Katun 13 Ahau ending variously from 33 to 85 years distant. This correlation then of November 22, 504, with 9.16.4.10.8, 12 Lamat 1 Muan entirely satisfies all pre-Spanish records of the Maya so far as our present knowledge reaches, and in a general way satisfies the post-Spanish records. But in details such as year bearers, exact year that a Katun 13 Ahau ended, and position of O Pop in the Julian year it disagrees with all post-Spanish sources.

Is there some way to reconcile these discrepancies of post-Spanish times? I will venture a suggestion here, leaving the consideration of its plausibility to those more competent than I am. The last inscription giving astronomical data in full agreement with old Empire inscriptions is the one at Chichen Itza 10.2.9.1.9. This was probably 900 years before Spanish times. Is it probable that during these 900 years, after the long count was abandoned, some small change or error crept into the calendar? We know that at Quirigua after 9.18.0.0.0 a definite change or error occurred which persisted through all the remaining monuments at that place. If we could assume that somewhere during these 900 years

a change of exactly 9 tuns occurred, whether by accident or design, then our correlation would agree with both pre-Spanish and post-Spanish data. April 10, 1536 was 12.8.11.0.0 according to our correlation. If we assume the 9 tun error or change as at all plausible the Maya were counting that day as 12.9.0.0.0, and we should have a Katun 13 Ahau ending in 1536, the year bearer would be correct and O Pop would fall just after the middle of July, as Landa indicates, and our correlation would even miss by only a couple of days agreement with Dr. Spinden's day to day correlation, at least during Spanish times, but of course not during the times of the Maya Empire.

The weakness of this suggestion is, of course, that it demands an error or change to fit the need. It can be regarded as no more than a suggestion. However, the evidence we have, such as it is, seems to point toward the correlation November 22, 504 equals 9.16.4.10.8 Maya as the most plausible one for the times of the Maya Empire. Applications of this correlation to different Maya inscriptions have produced to date most interesting results.

Postscript

Since the above was written in 1926, Senor Juan Martinez Hernandez[1] and J. Eric Thompson[2] have sent me copies of their recent articles. Both these authors revive the Goodman correlation of 11.16.0.0.0 13 Ahau 8 Xul equals October 31 or November 3, 1539, and both bring added evidence. If we accept the tuns given in the chronicle of Oxkutzcab and postulate an unbroken calendar for over one thousand years, then no other correlation is possible; but maybe we should not accept the tuns as accurate so long after the long count had fallen into disuse, and again under the circumstances of Aztec domination it may be just as plausible to postulate an adjusted calendar as an unbroken one. If we reject the tun evidence in this one chronicle, then other dates that are distant a multiple of 5.5.8.0 agree just about as well with the

[1] Paralelismo entre los Calendarios Maya Y Azteca; for Juan Martinez Hernandez, in "Diario de Yucatan," February 7, 1926.

[2] A correlation of the Mayan and European Calendars, by J. Eric Thompson; Publication No. 241, Field Museum of Natural History, January, 1927.

astronomical and other evidence and some agree better. If we do not postulate an unbroken calendar, then the Spanish evidence is of very little assistance because we do not know the quantity or character of the adjustment made. This is the reason for my belief that the correlation must come from pre-Spanish sources.

In the chronicle cited by Senor Martinez it appears that even the learned Indians were not aware that a certain day was 11 Chuen 18 Zac till they computed the date more or less accurately from old records. After this computation they correlate 11 Chuen 18 Zac with February 15, 1544. Senor Martinez says it should have been February 18, 1544, and computed from Bishop Landa's calendar it should be February 21, 1544. This latter date would be required to give the proper moon day if the 11.16.0.0.0 correlation is correct. In any case we have here only a calendar round date which recurs every 52 years in a slightly different position in our months.

Again the 11.16.0.0.0 correlation fails somewhat to agree with the apparent astronomical evidence in two points: one is the Venus conjunction and the other the conjunction of the sun with the moon's node. The former affects step 6 of the above discussion, where I have placed the 1 Ahau 18 Kayab zero date of the Venus calendar at 9.14.15.6.0; Willson placed this date two calendar rounds earlier at 9.9.9.16.0 because that date appeared on page 24 of the Dresden Codex. The 11.16.0.0.0 correlation demands that 1 Ahau 18 Kayab as a zero date should be placed 4 or 6 calendar rounds later than I have done and the latter would be at 10.10.11.12.0. It is possible that the number 1.5.14.4.0 on page 24 of Dresden Codex is meant to be added to 9.9.9.16.0 to give the 1 Ahau 18 Uo zero date in the long count and this would agree with 10.10.11.12.0 1 Ahau 18 Kayab as zero date and would satisfy the 11.16.0.0.0 correlation.

As to the second point of node conjunction, this correlation demands either that the table on pages 51–58 Dresden Codex is not a table of eclipse syzygies as our steps 2 and 3 above require, or that its date is not 9.16.4.10.8 as our step 6 requires. It seems to me rather certain that it is a table of eclipse syzygies. Anyone who takes the trouble to plot on a tzolkin wheel consecutive

eclipses visible in Maya territory over a period of only 50 or 60 years will see at once how naturally the Maya would be led to construct such a table, and how easy it would be for them to recognize the node conjunction days occurring every 173.31 days, without necessarily having any idea of the obliquity of the moon's orbit, of the meaning of a node, or of its bearing on the mechanism of eclipses. It seems to me that our steps 2 and 3 are fairly well grounded. In step 4, however, we have dated the table 9.16.4.10.8, as previous workers have done, but the 11.16.0.0.0 correlation demands a date for the table approximately between 10.14.0.0.0 and 10.15.0.0.0. No such date appears on pages 51 or 52. 10.19.6.0.8 as given on page 51 might be meant for such a date but is in error as it stands, and the correction is not obvious.

Of all the correlations that have been deduced from late Maya and early Spanish records the 11.16.0.0.0 one is by far the most promising in its relation to astronomical data of the inscriptions and codices, but it has the defects noted above. Of the 6 correlations given above, based on early Maya inscriptions and codices, the one dating 9.16.4.10.8 as November 22, 504 gives excellent agreement with the calendar of Spanish times if we admit a 9 tun calendar adjustment, and the one January 26, 548 agrees with an error or adjustment of only one moon (i.e., 29 days). If we could fix the dates of steps 4 and 6 beyond dispute, or if we could agree on the reliability of the tun statements in the Oxkutzcab chronicle, and on the probability or improbability of an unbroken calendar, then the correlation could be settled beyond argument. As the matter stands, however, there are insufficient data to regard any correlation as definitely proven, and it is important to continue the search for further data.

50 EAST 41 STREET,
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REPORT ON WORK OF FIELD MUSEUM EXPEDITION IN MADAGASCAR

FROM JANUARY TO SEPTEMBER 9, 1926

BY RALPH LINTON

I FEEL that a report on the activities of the expedition to date will be much more comprehensible if it is prefaced by a brief account of the conditions governing work in Madagascar. This is the more important as most of the English and American books dealing with the island contain a good deal of erroneous information. Mr. Osborn's book *The Land of the Man Eating Tree*, is the worst offender, but even the books of missionaries who have spent many years in the island usually contain misstatements. Their travels have usually been limited to a few provinces, and they have assumed that the conditions they found there were universal.

GEOGRAPHY

At least nine-tenths of the surface of Madagascar is mountainous or at least hilly. The only extensive pieces of level land are in the extreme south and along the southeast and southwest coasts. In the north the hills come down to the sea on both sides. The so-called plateaus in the interior are really masses of hills which would be classed as very fair-sized mountains anywhere east of the Rockies. There is a nearly continuous belt of forest along the entire eastern side of the island with numerous isolated forests on the western side. The center of the island is treeless, or nearly so. The extreme south is semi-desert, with thorny scrub and cactus. There are numerous rivers, but only the Betsiboka, on the west coast, is navigable for any distance.

CLIMATE

There are two seasons, the dry and rainy, the latter being much longer in the north than in the south. In the central part of the island, about Tananarive, the rains usually last from late October or November until late March or April. The heaviest

rainfall occurs in the north and east. Along the east coast as far south as Mananjary there are almost daily rains even in the dry season. During the real rainy season work in this region is almost impossible. The rains are lighter on the west coast, but impede work there considerably. I am informed that it is quite possible to work in the far south during the rainy season and that the best time to visit this region is at the end of the rains, when the water holes are full. During the latter part of the dry season there full desert conditions are reached, with water holes two and three days' march apart.

In general the climate is debilitating for Europeans even in the high interior plateau. I find that I tire easily and that the sun seems more violent than in any region that I have previously visited.

Transportation

Transportation is the most difficult problem here. There are railroad lines from Tamatave on the west coast to Tananarive, with branch lines leading northward to Andreba, at the southern end of Lake Alaotra, and southward to Antsirabe. From Antsirabe there is an auto road south to Ambalavao, with a branch east to the port of Mananjary. There is also an auto road from Tananarive to Maevatanana, the head of navigation on the Betsiboka river. Outside of these main lines there are practically no roads over which one could use a wheeled vehicle, even a bullock cart. Horses, which might solve the problem, are unable to stand the climate. Even those imported from Africa soon die. All Europeans and rich natives travel in a *filinzana*, a chair slung between two poles, which is carried by shifts of bearers. Eight to 12 men are required, as the natives are accustomed to fast marches and light loads. Forty pounds per man is the legal load limit, and forty to forty-five kilometers a fair day's march. There are practically no volunteer bearers to be had at the present time. Men are obtained from the government, which exacts bearer service as a form of tax. The rate varies slightly from province to province, but is normally 4 fcs. per day without rice, with 2 fcs. per day for the return journey, making an actual price of 6 fcs. a day for time of travel. Bearers are usually changed at

district headquarters, the old men going back to their own district. As they are forced labor, there is a good deal of grumbling and malingering, but desertions are rare and thefts from loads almost unknown.

There is almost no coastwise traffic. The only boats are two small steamers of the Messageries Maritimes line which operate under a government subsidy, one taking the east and the other the west coast. They are supposed to make 12 trips a year, but actually make about 6. I have met a missionary here in Majunga who has been waiting two and a half months for one of them. There is only this regular steamer on the east coast. On the west there are small native sailing craft of three or four tons burden and Arab Dhows, but the coast is dangerous and wrecks frequent so that they are only to be used as a last resort.

The filanzana with bearers is the only certain method of travel here, but even if one were to take full advantage of existing rail and auto roads, it would require a minimum of seven months to travel from end to end of the island overland.

Living Conditions

Living conditions are fairly easy as compared with Central or South America or even the Pacific Islands. There are fairly good hotels in all the large ports and the capital, and indifferent ones in a very few of the largest interior towns. When traveling one stays at the village house. Each large native village has one of these for the use of European travelers. It is the duty of the village chief to see that they are provided with food at a reasonable price. Travelers carry their own beds, chairs and cooking utensils, and are accompanied by a cook and boy. Food is very cheap in the back districts, but there is no variety, the regular thing being chicken and rice, with a rare egg or banana. Stores in the larger towns carry a small line of canned goods, but bread is unobtainable outside the largest places. The chief is expected to provide fuel and water free of charge, but expects a tip.

Health

In spite of the high altitude of most of it, Madagascar is decidedly unhealthy. All whites who have been here more than

a few months suffer from periodic attacks of fever, all three varieties of malaria being common. Plague seems to be epidemic and at the time of writing there are serious outbreaks here in Majunga and in Tananarive. No Europeans have died here so far, although there are 6 to 10 cases a day with only 2 recoveries to date. Tananarive reports several European deaths with 68 cases in one day and no recoveries. Intestinal diseases are rather rare, although there is a good deal of dysentery and some typhoid. Europeans become partially immune to malaria in time, so that the attacks are less severe, but never really recover while they remain in the island.

NATIVES

Language. All the tribes speak languages belonging to the same linguistic stock and their dialects are, for the most part, mutually intelligible. The grammar seems to be the same throughout, but there are many differences in the vocabulary. The most divergent tongue is that spoken by the Sakalava of the west coast, which requires a special interpreter.

Culture. The native culture, as revealed by my studies to date, seems to be surprisingly uniform. This is no doubt due to the fact that the natives themselves are great travelers. It is not uncommon to encounter men four or five hundred miles away from their real tribal territory. With the exception of one group on the far southeast coast and certain more or less Arabised tribes in the north and northwest, the ordinary tools and utensils of all the tribes are practically the same. Each tribe has certain specialties, however. The distribution of types of weaving will illustrate this. The weaving of *lambas* (mantles) of domestic silk is practically limited to the Hova, and they are the only ones who weave figures. The Betsileo weave wild silk, cotton, and a little hemp. The Tanala make beautiful lambas of hafotra (a species of bark), but make little use of cotton and apparently weave no silk, although the wild variety occurs in their country. The Betsimisaraka weave only raffia or a mixture of raffia and commercial cotton thread. The Tsimahety weave raffia and native cotton, but do much finer work than most of the Betsimisaraka and employ different designs. The Sianaka have entirely abandoned

weaving, buying their cloth from other tribes. Each tribe barters its special product to other tribes in return for their specialties, and objects are often passed for hundreds of miles in this way, increasing in value as they go. In general I have found that each important type of native product has a center where it is produced in quantity and can be had for a reasonable price. This tribal interdependence is certainly very old.

The non-material culture is somewhat more diverse than the material, but is also fairly uniform. The greatest differences seem to lie in burial customs and in political organization. Religion and its outward manifestation, the *ody* (charm), are nearly the same everywhere, although the natives are eager to obtain *odys* from other tribes, believing that the foreign witch doctors have more power than their own.

Character. The character of the various tribes differs considerably, necessitating different methods in dealing with them. The Hova, who are still the dominant group, are highly intelligent, and almost uniformly cowardly, treacherous, and dishonest. They can never be trusted unless held by self-interest. They are born traders, willing to sell anything if the price is high enough, and eager to ingratiate themselves with foreigners. The Betsileo are less intelligent, and are also cowardly, but are more honest and will serve a good master faithfully. They are extremely shy on first contact, but are very easy to deal with when confidence has been established. The great difficulty in collecting among them lies in their strong ancestor worship, which makes them unwilling to sell anything they have inherited. The Sianaka are also less intelligent than the Hova, but somewhat more so than the Betsileo. They have much more courage than either, and are direct in their dealings. They are not servile toward Europeans and seem to be fairly trustworthy. The Betsimisaraka are stupid, lazy, and insolent unless kept in check. They have been in fairly close contact with Europeans for the last 300 years and have little respect or liking for them. They are untrustworthy and somewhat thievish, a rare vice among the wild natives. The Tsimahety are moderately straightforward and courageous, and are courteous toward whites, but indifferent. As a tribe they are

rich, holding thousands of head of cattle, and obtaining objects from them is a question of diplomacy rather than money. They are inveterate cattle thieves and sometimes rob and murder merchants passing through their territory, but I have found them absolutely honest in money matters. The Sakalava are by far the bravest of the Madagascar tribes, and are also fairly intelligent. They are extremely proud, and are likely to be surly and insolent. They are well armed, and still cause the government considerable trouble. A lone white man traveling in the more remote parts of their territory is often denied food and lodging in their villages and annoyed in other minor ways. His life and property are usually safe. They hate the Hova much worse than they do the whites and frequently kill them. They are friendly toward Arabs, being partially Mohammedanized, and I am now trying to get an Arab interpreter to accompany me into their territory. They are rich in cattle and care very little for trade, so I fear collecting among them will prove difficult. I have no personal knowledge of the tribes farther south, but from reports their character seems to be much like that of the Tsimahety. One group, the Mahafaly, in the extreme southwest, has never been subjugated by the French, and is said to be the wildest in the island.

Local Help and Coöperation

Officials. I have found the higher colonial officials uniformly courteous and helpful and in many cases really friendly. There is a strong anti-American feeling here, however, due to the debt settlement and the decline of the franc, and I have had a little trouble with minor officials. I will certainly have a good deal more during the next few months unless the franc becomes stabilized. My dealings with the minor officials have been practically limited to visits of ceremony and requests for bearers. One or two have very kindly volunteered their assistance in my collecting work, and M. Amat, Chef de District at Mandritsara, sent me some old men to use as informants, but as a rule I have had better luck when working independently. The natives are universally suspicious of anything or any one connected with the government.

Missionaries. I have established close contact with all the missionary organizations working here. The most helpful have been Mr. John Sims, head of the Friends Foreign Mission in Tananarive, who has invited me to make his house my home whenever I am in the city, and Mr. D. O. Jones of Imerimandroso, who nursed me through a bad attack of fever. The Norwegian Lutheran and Norwegian American Missionaries have also shown me much kindness and will be of great assistance to me when I am working in the southern part of the island, their special territory. In general I have found the missionaries very useful for first introductions, but surprisingly ignorant of the life of the people among whom they worked and quite unconscious of what was actually going on even among their supposed converts. One of the best of them, who had been in the island fifteen years showed me a collection of charms given him by a witch doctor on his conversion, and was very much surprised to learn that the native had only turned over the boxes in which the charms had been kept, reserving the charms themselves for future use.

Colonists. There are very few white colonists outside the large towns, but nearly all those that I have met have been kind and helpful. As far as I know, there is only one American in the island who is engaged in business, but missionaries with their wives and children give it a total American population of about 28. There are a good many British, especially Mauritians and South Africans, and they consider me one of themselves. Both the French and British have an unshakable belief that I am really a U. S. government agent sent to look over the island with a view to its purchase by the U. S. and are correspondingly anxious to keep in my good graces. The American purchase idea seems to be a regular obsession with all of them.

Académie Malgache. This is a group of accredited scientists who are carrying on investigations along all lines. I have been elected an honorary member, and the other members have helped me a great deal with both information and suggestions as to profitable regions for work. They have placed their library at my disposal, including many unpublished reports and documents. The president, Dr. Fontoynoult, who is a student of Malagasy

religion, and M. Waterlot, who has done the only systematic archaeological work so far carried on here, have been especially helpful.

Working Methods

Experience has shown that very little information or material can be obtained while actually traveling. The best method is to remain in one place for from ten days to a month. I select some town which is a trading-center for the surrounding villages, settle down there, and make friends with the natives. Missionaries are very helpful in this, and a little amateur doctoring and a pocketful of candy are also useful. After five or six days the people become accustomed to me and will allow me to enter their houses freely. People coming to market take home word of me, and I am well received on my first visit to their villages. As a rule I do not buy much during this time, but try to learn the prices actually paid for things by the natives themselves and consistently pay somewhat above this when I do buy. I find that once I have established a reputation for fair dealing the natives very often allow me to set my own price on the objects I want, thus saving much time and trouble. After prices have been established I make a limited use of native collectors, but the best results are obtained by a house to house canvass, with especial attention to garrets and kitchens. I rarely find it necessary to regularly employ informants, for the old people are usually glad to talk. As far as possible, material is catalogued and notes written up each night. Important items of information are checked up by conversation with persons in other villages. Village chiefs and owners of houses where I eat or sleep expect small gifts.

Itinerary

I arrived at Tamatave January 17th, 1926, and went to Tananarive two days later by the first train. I remained in Tananarive until April 7 (through the worst of the rainy season), then went to Antsirabe, on the edge of the Betsileo country. The town of Antsirabe offered few opportunities for work, so I left it on the 12th, going south to Ambositra, where I remained until the 24th. This region offers fine opportunities for collecting, and

I was forced to leave it before my work was done. I had to visit the north of the island during the comparatively short dry season, and I knew that I could work at Ambositra and farther south even during the rains. I hope to return there in late December or January. I returned from Ambositra to Antsirabe on April 12th and remained there until the 30th in order to attend the great weekly fair. From Antsirabe I returned to Tananarive and remained there until May 18. On that date I went by train to Andreba, at the lower end of Lake Alaotra, and the next day by rickshaw (locally called Pousse-pousse) to Imerimandroso at the head of the lake. I worked there, with short trips, until June 10th, when I returned to Andreba and went by train from there to Ambatondrazaka, where an annual fair was being held. Leaving Ambatondrazaka the 12th, I arrived in Tamatave June 13, and remained there, waiting for the east coast steamer, the Imerina, until July 10th, a month and five days after the scheduled date for her departure. Leaving Tamatave on the 10th, I arrived in Maronatsetra the 12th, remaining there until the 21st. During this time I completed my Betsimisaraka collections, which had been begun at Tamatave, and got together bearers for the overland trip. On July 26 I arrived at Mandritsara, having finished the first half of my journey across the island. The culture of the Tsimahety, the tribe about Mandritsara, proved to be nearly the same as that of the Sianaka, among whom I had worked at Lake Alaotra, so I stayed a shorter time than I had planned, leaving on August 5th. I arrived at Antsohihy, on the west coast, August 9. From there I took a cattle steamer to Majunga on the 13th, arriving in Majunga the 15th. The regular west coast steamer, the Bagdad, had been scheduled to leave Majunga the 15th for the south, but after repeated false notices, is now posted as leaving on September 20th. The plague situation is so serious here that the southern ports have established a rigid quarantine against all passengers and goods coming from Majunga, so that if I should go south with her now I probably would not be allowed to land. I have, therefore, decided to go inland, by way of the Betsiboka river, making side trips into the Sakalava country, including one long trip from Maevatenana to Kandreo and return. From

Maevatanana I shall go to Tananarive, and from there south by train, auto and filanzana, eventually reaching Tulear overland from the rear. Things are so uncertain here that it is impossible to give a more definite statement of my future movements.

WORK AMONG THE HOVA (TANANARIVE, ANTSIRABE, ETC.)

As Tananarive is the capital of the island and the headquarters for most of the missionary societies and large commercial houses, a good deal of my time there was spent in establishing cordial relations with officials, questioning people who had come in from outlying districts, etc. The collections in the Tananarive Museum were studied, and various rare books in the Government and Académie Malgache Libraries were read and extracts copied. Much time was devoted to a study of the native language, a regular teacher being employed.

The Hova in and about Tananarive are all ostensibly Christian, and have been largely Europeanized. Many elements of the ancient culture have entirely disappeared and many others are on the point of disappearance. Nearly all the objects still manufactured by the natives could be bought in the great weekly market. The natives proved eager to sell, and brought old things of all sorts, and examples of the best silk weaving, to my house almost daily. A native collector was sent into the least civilized part of the province to try to find certain objects formerly in use, but was only partially successful. About 600 specimens were purchased, forming by far the best and most complete Hova collection which has so far been assembled. I hope to be able to fill the remaining gaps by having reproductions made of objects which are entirely obsolete, but have found this very difficult, due to the complete unreliability of the natives. The outstanding features of the collection are the textiles, especially the silk lambas (mantles), the stone lamps (now obsolete), certain very rare wooden utensils (obsolete), a practically complete collection of snuff boxes, showing all forms in ordinary use, and a fairly complete set of charm beads, with full information on their use and significance.

Many valuable notes were collected, old Hova and mission-

aries of long experience being used as informants. An outline was made and gradually filled in with details on the material culture, social life, etc. There are many old people whose memory goes back to pagan times, and the material should make an excellent report. Especial attention was apid to the Vazimba legends, and a good deal of quite new material collected.

The people of Antsirabe are largely Hova, but the town lies on the edge of the Betsileo country. The objects sold in the weekly market differ in some ways from both the pure Betsileo and the pure Hova, but incline more toward the former. They have been listed as Betsileo.

Work among the Betsileo (Ambositra and Vicinity)

The villages about the town of Ambositra proved to be by far the richest collecting field so far encountered. The natives are still quite primitive and carry on many of their old industries, while the fact that they have occupied the same houses for several generations has led to a gradual accumulation of old things in attics and storehouses. They lack the trading instincts of the Hova, and practically all material was obtained by house to house canvassing. The main obstacles to collecting were their shyness and their strong ancestor worship, which made them unwilling to sell inherited objects. These were eventually overcome and a good collection obtained. The wooden utensils and wood carvings are especially valuable and noteworthy, for such things are no longer manufactured. The most striking pieces are an old carved bed, which will be the only one in any museum, and a very old carved box for clothing, which is unique. The textiles are also fine, especially those made from wild silk and from hafotra bark. In the latter only old vegetable dyes have been employed, giving wonderfully soft and beautiful colors. Some very fine old mats and baskets were bought from Radaniel, the last of the Betsileo chiefs. A remarkable black jar, decorated with bold designs in applied strips of clay, and a cream-colored bowl decorated with designs in red represent the high points in their pottery-making. A little jewelry was also obtained, including old silver beads of a peculiar type, massive silver neck chains, and old coral and silver earrings.

About 375 pieces were bought, but the collection is still incomplete, and I plan to return within the next few months.

Many notes were made on various industries, but little other information was obtained, due to the reticence of the natives. There is a good deal of published information on them, however, so that the loss is not serious. A striking feature of their country is the great number of large memorial stones, precisely like European menhirs, which are to be seen on all sides. The erection of these monuments is still going on. I saw a small one, with an inscription, which had been raised to commemorate Betsileo killed in the great war. Their tombs are large and elaborate, and there are many sacred places. In one of my trips I came upon a figure of a snake nearly thirty feet long which had been cut in the hard clay of a hillside, but could get no information about it.

Work among the Sianaka (Lake Alaotra)

The material culture of the Sianaka is much simpler than that of the Betsileo. Their artifacts are well made, but are limited to a few forms. They do some very clever carving of figures in the round. Weaving has been entirely given up, but they make the best mats in Madagascar. About 250 specimens were collected, the most important objects being a number of very fine mats, carved miniature paddles (formerly a badge of rank), a set of silver jewelry belonging to the family and worn only at weddings and funerals, and a fine collection of charms and sacred objects, including two sorcerer's staves. I was also lucky enough to get a few examples of the ancient weaving in raffia and one piece of wild silk weaving which is different from anything I have seen elsewhere. Three small shoe-shaped jars, used by witches and medicine-men for brewing potions, are of especial interest, for they are identical with a type of pottery found in the ruins in the southwestern United States. The Sianaka collection is practically complete and I believe further work would add little if anything to it.

A great deal of valuable information dealing with the native religion, especially with the practices of wizards, was obtained. Unfortunately my best informant was suspected of poisoning me

when I had a sharp attack of fever and was killed by the other natives, who were afraid of trouble with the government. Notes were also made on native marriages, funerals, etc., and on industrial processes. It was discovered that the designs used in mat making were all named, and in some cases seemed to be used with magical intent. This has not previously been reported for Madagascar, nor have I found indications of it elsewhere. I feel that my work with the Sianaka has been completed satisfactorily.

Work among the Betsimisaraka (Tamatave and Maroantsetra)

My work among the Betsimisaraka has been less satisfactory than that with any other group. Their material culture always has been poor, and there have been European settlements along their coast since the latter part of the seventeenth century, so that very little is left at the present time. They make no pottery, as their country is sandy, importing the little they need from the Sianaka to the west. Folded leaves are used for plates and spoons, being renewed at each meal. They do no wood carving, and their mats and baskets are mostly poorly made and without decoration. Their only important product is fine raffia cloth, now usually made from a mixture of raffia and imported cotton thread. A good collection of these raffia cloths was obtained, together with one of the crude treadle looms on which they are now woven. This type of loom is a rather recent innovation, the idea having been taken from the Arabs. The older type of loom is identical with the Hova one. Specimens of all the utensils in ordinary use were collected, also various musical instruments, a paddle, fish traps of two types, etc., making a total of 88 pieces.

A little information on technical processes was obtained, but hardly anything else, due to the complete collapse of the ancient social organization and religion.

Work among the Tsimahety (Mandritsara and Vicinity)

The work among this tribe was fairly successful. The ancient culture was simple, but it is still almost intact. No weapons were obtained, for the natives feared that if they showed such things

to me they would be seized by the government, but the collection is otherwise nearly complete. The most important native products are very strong, flexible baskets of raffia, and raffia cloths for lambas and skirts. The cloths are often mixed with cotton, either commercial or native, and are the finest I have seen so far. Lambas are usually in natural color, a light tan, with broad striped borders. They are traded as far as Tananarive and bring high prices. A black, graphite-coated pottery of good grade is made, and there are a few cleverly carved staves or canes. Their mats are identical with those of the Sianaka, although usually somewhat coarser. They still make considerable use of charms, and a fine collection of these was obtained, including some unique pieces. The most remarkable are the complete equipment of a native doctor, a warrior's charm necklace containing rare beads and silver cornucopias for charms, a large silver horn containing charms, a small figure into which sickness was drawn, and two charms for killing enemies. One of these, consisting of 3 charms wrapped up together and placed in a basket, is of the most dangerous type, and could not be kept in the owner's house, as it would cause his death. A man who thought its owner was operating against him showed me where it was hidden on condition that I carry it off, which I did.

Some very valuable information was obtained from old men in the various villages, that dealing with the Vazimba, or first inhabitants, being the most important. According to them, the Vazimba were the actual ancestors of most of their tribe. They lived in caves or dugouts in the clay hills, cultivated rice, and fought with the blowgun and axe. This would indicate that their culture was Malayan rather than African. Later people from Africa came and conquered them, introducing the bow and arrow and probably cattle. An excellent description of the old bow and arrow was obtained. This is of considerable importance as the use of the bow as a weapon in Madagascar has frequently been questioned. A good deal of information was also obtained on ancient burial customs, social organization, and religious beliefs and practices. The natives denied true ancestor worship, which, if true, would differentiate them from the other Malagasy. Slightly over 250 objects were purchased or donated.

Work among the Coast Sakalava of the North (Antsohihy and Majunga)

Antsohihy lies well within the Sakalava country, but there are comparatively few natives in the town. It is a trading-center mostly inhabited by Indians and Arabs. My stay was too short to establish many contacts with the natives, but I was able to buy a few good things from country people who had come in to trade. Majunga is quite a large civilized town, with a large Arab, Hindu and White population, but there is a native village in easy reach, and I have been highly successful in collecting there. The severe epidemic of plague now under way has paralyzed all business, and many of the natives are badly in need of money. A good many of them are trying to get away on small coasting boats and chows, which takes ready cash, and they are willing to sell almost anything. As I have been innoculated against the plague I am not particularly afraid of it, and I have made a practice of visiting the quarters of the village where it was worst and offering to buy jewelry, etc., from natives who were in danger and anxious to get away. In this way I have gotten six raffia prayer rugs and much jewelry. The rugs are made by Mohammedanized Sakalava for their own use, and at ordinary times they will not sell them to Christians. I find that most of the whites here have never even seen them. I feel that the jewelry collection is perhaps the most remarkable thing I have secured on the expedition. The Sakalava are a rich tribe, and until the beginning of the war it was their practice to have gold and silver money that came into their hands worked up into massive jewelry. Since the drop in the value of the franc the Hindus have been buying this up for the sake of the metal, and in another couple of years it will be nearly all gone. Because of the plague, the natives sold me many pieces that were treasured heirlooms. Among other things I have gotten two necklaces of big gold beads, 2 solid gold ear plugs of exquisite filigree work, 6 ear plugs of gold and silver, quantities of silver ear plugs of all sorts, many beautifully worked, a silver headband, and a large number of necklaces, chains, bracelets and anklets, showing all the styles in use. The weight of the metal is about 30 lbs., and the specimens have been bought for less than their actual value as

silver. The collection will make a fine exhibition, and I am convinced that it can never be duplicated unless certain pieces are copied. The natives also make very artistic painted pottery, and a good collection of this has been obtained. With the Sakalava material that I hope to get during the next two months it should be possible to make the Sakalava exhibit one of the outstanding features of the Madagascar hall. 275 pieces, over 200 of which are jewelry, have been collected to date (September 9th).

Summary

I believe that my work among the Hova, Sianaka, Tsimahety, and Betsimisaraka is particularly completed, although I still hope to obtain more information on ancient Hova beliefs and practices and to get reproductions of some obsolete objects. My work with the Betsileo is about half done, and that with the Sakalava only begun. A great deal of new information has been obtained, and this points to some rather startling conclusions. Evidence is piling up that the Malay element was the first to occupy the island, although it has been universally believed that the aborigines were Negroes. The work of collecting has been highly successful, with a total of about 1750 specimens purchased to date. The collections include all the ordinary forms of tools and utensils, with many rare objects and good collections of the specialties of all the tribes visited. Although I hope to at least double the number of specimens before my work is finished, I am under the impression that the collection as it now stands is by far the best Madagascar collection in existence. If the work should be terminated to-morrow, I should still feel that the expedition had been a success.

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DISPOSAL OF THE DEAD

By A. L. KROEBER

SOME years ago, in assembling data on methods of disposal of the dead in aboriginal California, I was struck by the fact that the distribution of burial and cremation customs failed to conform to the distribution of other culture traits in the area and was unusually irregular in itself.[1] The lines separating the two mortuary practices on the map ran across rather than with topographic, climatic, and floral boundaries. They departed considerably from the approximately definable limits of culture areas or sub-areas. And there was no agreement whatever with the distribution of other customs connected with death, such as name taboos, mourning restrictions, property destruction, or the public mourning anniversary ceremony. If the distributions were to be interpreted as is customary, it was evident that methods of corpse disposal had had a history that was less simple and regular, and more fluctuating, than most elements of native Californian culture.

Archaeological evidence, though incomplete, partly confirmed this conclusion. Burials have been found in the territory of several groups practising cremation at the time of discovery: Salinan, Costanoan, Coast Miwok, Maidu, Yokuts. Conversely, mounds on Humboldt and perhaps on San Francisco bay showed cremated remains in addition to the usual interred ones. This may not seem a specially impressive list, but it must be remembered that native California is a region of unusual cultural stability, and that ordinarily the archaeological and ethnological data from any particular area in the state are in close agreement.

As there are bound to be variations in the stability of customs, a tendency of corpse disposal practices to be changeable would be of no special moment, were it not for the powerful affects released by death and the fact that affects are not expressed

[1] Handbook of the Indians of California, Bureau of American Ethnology, Bulletin 78: 841–843, 900–901, map fig. 70, 1925.

spontaneously in culture but in conditioning. The naive assumption would probably be that a charging with affect would cause an established custom to be adhered to with special tenacity, and thus make for its stability. But as there need be no positive relation between intensity and permanence of emotion, or the intensity of an emotion and its manifestation in behavior, a theoretical problem is raised. It is evident, for instance, that our culture is at present divided between interment and cremation, the latter practice being of recent origin, on the increase, but still in the minority. Sentiment is in part indifferent; but considerable elements of our communities feel a quite powerful preference for one or the other of the conflicting usages. Is there then perhaps inherently less stability in affect-laden customs, or is such stability as they possess due to factors other than the degree of associated emotion?

Rivers has called attention to a situation in Australia analogous to that in California. He says:

> Few customs of mankind take so firm a hold of his imagination as his modes of disposing of the bodies of his dead. . . . . It is difficult to see in the environment of the Australian anything which could have led him, unaided and untaught, to evolve a variety of funeral rites. What, as a matter of fact, we find is that nearly every one of the chief known methods of disposal of the dead is practised in Australia. We find inhumation in the extended and the contracted positions, we find preservation on platforms, on trees and in caverns. There is embalming though of a simple kind, and, lastly, there is cremation. . . . . People do not adopt new funeral rites merely because they see or hear of them elsewhere.[2]

Rivers goes on to argue that this condition is "the outcome of permanent settlements of strangers" in Australia. This explanation is part of a plan for resolving culture variations by the mechanism of contact of migrant bodies of people, rather than through more intricate and subtle modes of culture contact. This particular argument serving other ends, it need not be further examined at the moment; the fact of diversity and change in Australian mortuary customs, however, is of bearing.

Variety and change also characterize the late prehistoric

[2] W. H. R. Rivers, The Contact of Peoples, in Essays and Studies presented to William Ridgeway, 474–492, 1913 (passages cited, 480, 481).

periods of Europe. Déchelette has reviewed the salient facts with his usual lucidity. The Palaeolithic and most of the Neolithic interred; but cremation occurred in Finistère, Aisne, and Marne in the latter period; and desiccation, contracted burial, secondary burial all are established. "None of the mortuary customs of the Neolithic seems to have had constant usage in Gaul." The belief that cremation was introduced in France by a wave of bronze age invaders can no longer be maintained. In fact, cremation did not prevail in France until the fourth phase of the bronze age; although Brittany, following its Neolithic beginning, burned the dead during the first and second phases. In Greece, cremation begins with the early iron age, later Mycenean tombs still containing burials. In western Asia cremation was unknown or rare, whereas India adopted it early. In central Europe, from Scandinavia to Italy, cremation got the upper hand in the second bronze phase. In north Germany, it remained in vogue into Roman times; in south Germany and France, burials often replace urns of ashes in the late finds. Cremation evidently originated "spontaneously" (independently) among several peoples of Europe and Asia.[3]

For South America, there is Father W. Schmidt's instructive assemblage of data, marshalled in support of still another interpretation, the *Kulturkreis* theory.[4] His map is herewith reproduced in somewhat altered form. There are some evident centers of frequency or characterization for the various mortuary usages, but scarcely any practice has a well limited distribution, so that the history of their interrelations is almost certain to be complex and custom must often have changed.

Father M. Küsters has made a more intensive study of African funerary practices.[5] The distribution of a few of his items is reproduced in the accompanying map. It appears that certain habits, such as air burial in trees or scaffolds, and simple exposure or discarding of corpses, have an exceedingly irregular distribution

[3] J. Déchelette, Manuel d'Archéologie, 1: 465, 471, 1908; 2: 133, 154, 159, 1910.

[4] Kulturkreise und Kulturschichten in Südamerika, Zeitschrift für Ethnologie, 45: 1014–1124, 1913 (map, p. 1076).

[5] Das Grab der Afrikaner, Anthropos, 14–15: 639–728, 1920–21; 16–17: 183–229. 913–959, 1921–22.

FIGURE 1.

Disposal of the dead in South America: adapted from Schmidt. 1, simple burial; 2, secondary burial; 3, urn burial; 4, urn reburial; 5, house burial or reburial; 6, mummification; 7, cremation; 8, secondary cremation; 9, eating of ashes; 0, scaffold exposure.

in Africa. Other practices show some tendency to group on the map: mummification in the West African culture area; water burial in the area of Madagascar, the opposite coast region, and the headwaters of the Nile and Congo; cremation in the part of the continent east of longitude 10 east of Greenwich. In each of these instances, however, there are scattered occurrences outside

FIGURE 2.

Disposal of the dead in Africa south of latitude 20° north: selected from Küsters. A, air burial (in trees, on scaffolds); F, fire, cremation; M, mummification; W, water burial; broken lines, limits of simple exposure of discarding of corpse.

the regions of characterization. Küsters reviews also burial in graves with roofs or niches, in houses or burial huts, under rock piles, in urns, secret and partial burial, unfleshing of the bones, and other methods. The assemblage of these on his original map makes this bewildering in its complexity. Of particular interest are the frequent limitations of a particular method to a particular

social class, so that several methods coexist in one tribe, and the same method has different applications in successive tribes. Thus, river burial is sometimes reserved for chiefs, sometimes for the drowned, sometimes is the normal practice of a group. Tree and platform burial is in certain populations restricted respectively to musicians, magicians, the bewitched, the lightning struck, criminals, and kings; cremation is generally reserved for criminals, but also occurs as the usual practice; exposure is variously in usage, according to tribe, for the corpses of criminals, slaves, children, the common people, the entire population. These variations between adjacent peoples, and the numerous instances of coexistence of several practices within one population, constitute a powerful argument for instability. They virtually prove change where ordinary intertribal distributions only indicate it. A tribe following three or four methods, and in contact with tribes that follow other methods or employ the same methods for different populational groups, can scarcely be likely to adhere long to its customs of the moment without alteration.

These instances perhaps suffice to establish that disposal of the dead often shows a fluctuating history instead of the relative stability which a first judgment might attribute to it. From this follows the generalization that intensity of feeling regarding any institution is likely to be a poor criterion, if any, of its permanence. Emotion evidently attaches secondarily to social behavior much as thought does. The completeness and plausibility of a rationalization are no index of the reality of its purported motivation; the immediacy and intensity of emotion concerning a cultural practice are no index of the origin or durability of that practice. The stimulus of such an emotion may be a physiologic or "natural" situation, to which a social practice also relates. The emotion or some of it promptly adheres to the practice. But it has not caused the practice; it evidently does not maintain it; and it attaches itself to a new practice as soon as this, from causes which may be relatively uncharged with emotion, displaces the older practice.

The further question whether affect-laden practices are not perhaps actually more unstable than emotionally low-toned ones,

cannot be answered summarily. There are certainly instances of mortuary habits that have continued for long times with only minor modification: in dynastic Egypt, for instance; in most of Europe during most of the Neolithic; in all but the fringe of Pueblo culture.[6]

More fruitful, perhaps, is a consideration of the type of motivation or historic causality that influences modes of disposal of the dead. Here it appears that a feature which is pretty likely to characterize mortuary practices is their dissociation from certain large blocks of cultural activity, expecially those having to do with material and economic life, its subsistence and mechanical aspects. That is, disposal of the dead has little connection with that part of behavior which relates to the biological or primary social necessities, with those activities which are a frequent or constant portion of living and therefore tend to become interadapted and dependent one on the other. On the other hand, disposal of the dead also does not lend itself to any great degree of integration with domains of behavior which are susceptible of formalization and codification, like law, much of religion, and social organization. Standing apart, therefore, both from the basic type of activities which mostly regulate themselves unconsciously, and from those which largely involve relations of persons and therefore become socially conscious and systematized, disposal of the dead falls rather into a class with fashions, than with either customs or folkways on the one hand, or institutions on the other. It does not readily enter intrinsically into the inevitable integrations of the bases of life nor into attempts at wider systems. In their relative isolation or detachment from the remainder of culture, their rather high degree of entry into consciousness, and their tendency to strong emotional toning, social practices of disposing of the dead are of a kind with fashions of dress, luxury, and etiquette.

It may be added that in so far as mortuary practices may be accepted as partaking of the nature of fashions, they will tend to

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[6] A. V. Kidder, An Introduction to the Study of Southwestern Archaeology, Phillips Academy, Andover, 1924.

discredit certain interpretations based on them. Rivers' contention that the variety of Australian practices is to be construed as due to intrusion of migrant groups certainly falls to the ground. Schmidt's employment of such practices as indicative of the spread of hypothetical blocks or complexes of culture becomes less convincing. And Küsters' inquiry into motivation, objectively founded as part of it is, can hardly be followed all the way if fashion impulses have moulded methods of disposing of the dead as extensively as it would seem they have.

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THE CHINESE FAMILY: ORGANIZATION, NAMES, AND KINSHIP TERMS

BY CHING-CHAO WU

Family Organization

TO OCCIDENTALS the word family connotes a group of people consisting of husband, wife, and children. This, however, is not true in China. A typical Chinese family, as Maclagan puts it, "might consist of father, mother, sons, daughter-in-law, and grandchildren."[1] To have five generations living under one roof is not rare in China because of the custom of early marriage.

After the death of parents, the brothers may break up the family and live separately. They may still live together in the same household if they choose to do so, in which case authority is vested in the eldest brother. He is responsible for the maintenance of every member of the family and has the right to demand that other members of the family turn their earnings into the common purse to be used for the current expenses of the whole family. In practice, his authority is not absolute. Important questions of the family are not decided by him alone, but by the concurrent opinion of all the adult male members of the family.

The Chinese family is seldom an independent unit, but a member of the greater-family. In the Chinese village, families bearing the same surname live together. The members of the greater-family generally number hundreds and sometimes thousands. They have a common ancestral temple which is the center of their social and religious life. Whenever a person of the greater-family dies, a tablet made of wood bearing his or her title and name is put in the shrine of the ancestral temple. The ceremony of ancestor worship[2] is conducted in the ancestral temple, usually

[1] *Family* (*Chinese*) in Hastings, *Ency. of Religion and Ethics*, Vol. v, p. 730.

[2] According to Mr. P. L. K. Tao, "ancestor worship did not originate from the dread of ghosts, nor is it an animistic lottery for securing material welfare or advantage. Ancestor worship is rather the expression of an instinctive craving to trace the origin

on certain festivals and on the anniversary of the birth and death of each ancestor. The ceremony is rather simple. Every family brings dishes and wine to the ancestral hall, putting them on the table. Then every member of the family, facing the table, makes three bows to the imagined spirits of the ancestors. At the same time incense and paper money are burned.

In the ancestral temple, many big tablets of honor hang on the wall. They may be compared to the monuments of western countries. On each of these tablets are recorded the honorable and admirable deeds of the worthy members of the ancestral temple. For example, a man of high political achievement will, at his death, be honored by his fellow kinsmen by having his name and deeds recorded on the tablet. Such monuments have, it is believed, a powerful stimulating influence on the minds of the children who hear the stories of their great ancestors after each rite of ancestor worship.

The greater-family is well organized. A board of elders consisting of the oldest member of each family is in charge of the greater-family affairs. At a certain time of the year a regular meeting of the board is held. Among other things, the birth of a male child and marriages are recorded at this time. These will later on be transferred to the genealogical record[2] which is made of two parts: first, diagrams of names, second, biographies. The genealogical record is revised generally every sixty years, so that new names and biographies may be added thereto, After the revision, the record is printed and distributed among the families.

The board of elders also takes care of the property which belongs to the greater-family as a whole. The income from the

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of the self. . . . . Every Chinaman loves to trace the long history of his own family thinking of himself as a transitional life linking up the past and the future. . . . . On the whole, ancestor worship is not a blind worship: it is respect for the past, gratitude for what the past has handed down, admiration of the good example of the past." See his article on "The Family System In China, in *The Sociological Review*, 1913, Vol. 6, pp. 47-54.

[2] Dr. Yu-Yue Tsu remarks that "the families of the clan (meaning thereby the greater family) acknowledge a common male ancestor or ancestors, whether real or adopted, and are thereby held together and known by the common family name. Genealogical records are carefully kept in order to substantiate claims of clan privileges, and to regulate the degree of kinship." See his *The Spirit of Chinese Philanthropy*, p. 75.

property is used to defray the expenses of ancestor worship as well as for educational and philanthropic purposes.

To illustrate the last point the case of the *Van* estate may be cited. In the Twelfth Century a member of the *Van* greater family[4] established an estate consisting of farm lands, farming implements, a granary, and some living houses. The objects of the estate were to relieve the members of the greater-family from poverty and destitution, to encourage the education of the young, to reward virtue, such as filial piety and virtuous widowhood, and to maintain the solidarity of the greater-family. Certain persons in the greater-family received special grants under specified conditions. They were: students pursuing or preparing for a literary career, aged persons and widows.

The board of elders also has judicial power. When there is a dispute between two families, they refer the matter to the board for decision. The board of elders then calls a meeting in which not only the elders of the board but all influential members of the greater-family take part. The two parties present their claims and arguments, and, after discussion, persuasion, and compromise, a certain agreement is brought about. Such agreement has the sanction of public opinion of the greater-family, and the contesting parties generally abide by it.

The punishment which the board of elders can impose on the members of the family are of various sorts. It is said that in some parts of China the board of elders has the power of using capital punishment. This, if not untrue, is extraordinarily rare. In general, for misdemeanors, the punishment ranges from reproach to dismissal from the ancestral temple.

Such is the general feature of the Chinese family. For the last few decades changes have been going on in this system. The conditions which bring about this change are: contact with the West, the slow but sure emancipation of woman, and the industrial revolution. The trend is evident; but what final shape the Chinese family will in the future assume, is, as yet, very hard to tell.

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[4] For a more detailed account see Dr. Tsu's book, pp. 79-83.

Names

In China, not only persons have names, but also the family and the greater-family. In every main dwelling house of the family, at the center and below the ceiling, is a tablet bearing three Chinese characters, usually the name of the family. The third character is universally the word *tong*[5] which means literally the "house" or the "hall." The first two characters are chosen with care. Some choose two words which express the wish of the family, for example, *Pei Yuan*, which means "educating the descendants," or *Shih Tsu*, which means "perpetuation of the line." Some choose words which connote desirable qualities; for example, *Chien Ho*, which means "goodness and peace." The family name is used on such occasions as erecting a tombstone or marking the implements possessed by the family.

Like the family, every ancestral hall has a name, which is also the name of the greater-family. Three characters make up the name, and the third character is also invariably the word *Tong*. As every greater-family has an ancestral temple, and there are thousands of them even in one district or county, a name for each is necessary in order to avoid confusion. In certain districts of China it is the custom for people to print their greater-family name on the lantern, so, in the night, when one passes a village with lantern in hand, the people immediately know from what village and family he comes.

The name of a person generally consists of three characters. The first character is his surname, the second and third characters his personal name. There are exceptions. Sometimes one finds a name of two or four characters. In the former case, it is because the person chooses only one character as his personal name; in the latter case, it is because the person's surname happens to be of two characters. Contrary to the practice of Europeans, the Chinese put the surname first.

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[5] This, however, should not be associated with a kind of warfare which is very common in the United States and which is known as *Tong* war. *Tong* war in the United States is carried on between two Cantonese unions which are economic in character. Every Cantonese union in this country has a name, such as *On Leong Tong* or *Hip Sing Tong*. That is why the warfare between them is known as *Tong* war.

The fact that the Chinese have more than one name puzzles foreigners. When a child is born he is given at once two names. One is called *Yu Ming*, or "milk name." This name consists of one or two characters only, without the surname attaching to it. It is used by his parents and relations. The other name is called *Hsueh Ming* or "school name" because the boy uses it in the school and is known to his teachers and friends by that name. It is also called *Pu Ming* or the "genealogical name," because only this name is put in the genealogical record which most families or greater-families keep. This name generally consists of three characters: the first character is his surname; the second character is his *Pei Ming* or "rank name," which he possesses in common with his brothers, his cousins on the father's side, and all members of the same generation of the greater-family; the third character is the only name which his parents need to choose for him and half of this character or name he possesses in common with his brothers.[6]

When the child reaches the age of twenty, or, as the practice goes, much earlier than that, he may take another name which is called *Tze* in Chinese. This consists of two characters. The *Tze* is always selected with reference to the genealogical name. For example, suppose one's genealogical name is *Wu Ching-Tung*, he may use *Shao Pu* as his *Tze*. *Shao Pu* means "wide learning," an interpretation of the word *Tung*. After the selection of a *Tze*, a man is no longer addressed by his friends by his genealogical name. He is called now by his *Tze*. But, this does not mean that the genealogical name is no longer functional. The bearer still uses it in writing letters to his elders, in signing contracts, and in official matters.

An average Chinaman possesses the above mentioned three names. As a rule all three names are chosen for him by his parents, but as the name is a part of one's personality, people in China are

[6] One needs a little knowledge of the Chinese language to understand the significance of it. Many Chinese characters consist of two parts, hundreds of characters having one part (either left or right, upper or lower) identical with left or right, upper or lower part of another character. Therefore, it is easy for the parents to choose names for their children by using characters having one part in common.

very particular about their names and like to have the one which will be appropriate to their tastes. So, besides the milk name, the genealogical name, the *Tze*, one may have a *Hao*, or "style." The *Hao* is selected by the bearer and consists of two characters. He may have a *Pieh Hao* or another style which consists of three or five characters. *Pieh Hao* may be compared to the *nom de plume* used by a literary man or an artist.

It is also the custom in China to address a person by his title, as people in the United States call Mr. Calvin Coolidge "President Coolidge" or Mr. Theodore Christianson "Governor Christianson." Another practice is not found in western countries: the great man is called by the name of the district (which corresponds to the county in the United States) in which he was born. Thus, *Tuan Chi-Jui*, the present President of China, is called *Tuan Ho Fei*, *Ho Fei* being his native district. This is a great honor; not more than a dozen Chinese are thus called by their fellow countrymen.

Before the Twentieth Century it was the custom for the Imperial House to bestow a posthumous title upon great officials. Only people of worthy achievements received this honor. A great teacher, at his death, was honored by his students with a posthumous title. This practice seems to have ceased since the establishment of the Republic.

It is possible, then, for a Chinaman to have eight names: (1) milk name; (2) school name or genealogical name; (3) *Tze*; (4) *Hao*; (5) *Pieh Hao*; (6) official title as name; (7) native district as name; (8) posthumous title.

Kinship Terms

1. Father *Fu*
2. Mother *Mu*
3. Grandfather
   a) Father's father *Tsu Fu*
   b) Mother's father *Wai Tsu Fu*
4. Grandmother
   a) Father's mother *Tsu Mu*
   b) Mother's mother *Wai Tsu Mu*

The Chinese have different kinship terms for father's and mother's parents. There is no kinship term for the parents of *Wai*

Tsu Fu. This reflects the patrilineal character of the Chinese family.

5. Great-grandfather (father's grandfather) *Tseng Tsu Fu*
6. Great-grandmother (father's grandmother) *Tseng Tsu Mu*
7. Father of great-grandfather *Kao Tsu Fu*
8. Mother of great-grandfather *Kao Tsu Mu*
9. Son *Tze*
10. Daughter *Lü*
11. Grandson
    a) Son's son *Sun*
    b) Daughter's son *Wai sun*
12. Granddaughter
    a) Son's daughter *Sun Lü*
    b) Daughter's daughter *Wai Sun Lü*

There is no kinship term for a descendant of daughter's son.

13. Great-grandson (son's grandson) *Tseng Sun*
14. Great-granddaughter (son's granddaughter) *Tseng Sun Lü*
15. Son of great-grandson *Hsiun Sun*
16. Daughter of great-grandson *Hsiun Sun Lü*
17. Uncle
    a) Father's elder brother *Pei Fu*
    b) Father's younger brother *Shu Fu*
    c) Husband of father's sister *Ku Fu*
    d) Mother's brother *Chiu Fu*
    e) Husband of mother's sister *Yi Fu*
18. Aunt
    a) Wife of father's elder brother *Pei Mu*
    b) Wife of father's younger brother *Shu Mu*
    c) Father's sister *Ku Mu*
    d) Wife of mother's brother *Chiu Mu*
    e) Mother's sister *Yi Mu*

There are three points to be noted. First, the Chinese have five different terms for the word uncle and another five for aunt. Secondly, age is a base for the difference of kinship terms. For example, there is one term for father's elder brother and another for father's younger brother. The distinction of *Pei Mu* and *Shu Mu* is not made with reference to their own age, but with reference to the age of their husbands. Often *Pei Mu* is younger than *Shu Mu*. Thirdly, age status is disregarded in addressing mother's

brothers and father's sisters. There is only one term for mother's elder and younger brothers and one term for father's elder and younger sisters.

19. Brother
    a) Elder brother *Ko*
    b) Younger brother *Ti*
20. Sister
    a) Elder sister *Chah*
    b) Younger sister *Mei*
21. Nephew
    a) Brother's son *Tze*
    b) Sister's son *Wai Sun*
22. Niece
    a) Brother's daughter *Tze Lü*
    b) Sister's daughter *Wai Sun Lü*
23. First Cousin
    a) Son of father's brother who is older than the speaker *Tang Ko*
    b) Son of father's brother who is younger than the speaker *Tang Ti*
    c) Son of father's sister, or son of mother's brother, or son of mother's sister who is older than the speaker *Piao Ko*
    d) Son of father's sister, or son of mother's brother, or son of mother's sister who is younger than the speaker *Piao Ti*
    e) Daughter of father's brother who is older than the speaker *Tang Chah*
    f) Daughter of father's brother who is younger than the speaker *Tang Mei*
    g) Daughter of father's sister, or daughter of mother's brother, or daughter of mother's sister who is older than the speaker *Piao Chah*
    h) Daughter of father's sister, or daughter of mother's brother, or daughter of mother's sister who is younger than the speaker *Piao Mei*
24. Second Cousin
    a) Male descendant in the male line of the same great-grandfather and older than the speaker *Tsai Tang Ko*
    b) Male descendant in the male line of the same great-grandfather and younger than the speaker *Tsai Tang Ti*
    c) Female descendant in the male line of the same great-grandfather and older than the speaker *Tsai Tang Chah*
    d) Female descendant in the male line of the same great-grandfather and younger than the speaker *Tsai Tang Mei*
25. Father-in-law
    a) Wife's father *Yo Fu*
    b) Husband's father *Ung*
26. Mother-in-law
    a) Wife's mother *Yo Mu*
    b) Husband's mother *Po*

27. Brother-in-law
    a) Elder sister's husband *Chah Fu*
    b) Younger sister's husband *Mei Fu*
    c) Wife's elder brother *Lei Ko*
    d) Wife's younger brother *Lei Ti*
    e) Husband's elder brother *Pei*
    f) Husband's younger brother *Shu*
    g) Husband of wife's sister *Lin Chin*
28. Sister-in-law
    a) Elder brother's wife *Shao*
    b) Younger brother's wife *Ti Fu*
    c) Wife's sister *Yi*
    d) Husband's brother's wife *Chu Li*
    e) Husband's sister *Ku*
29. Daughter-in-law *Shih Fu*
30. Son-in-law *Lü Hsu*
31. Husband *Fu*
32. Wife *Chieh*

The above are norms.[7] In practice we find many deviations. For example, a man, instead of calling his father *Fu*, may call him *Baba* (papa) or *Yieh*. Again, instead of calling father's oldest brother *Pei Fu*, one may call him *Ta Pei* which means "first Pei." If his father has another elder brother, he may call him *Erh Pei* which means "second *Pei*." Thus Chinese family relationship is well defined and no one misunderstands another when he refers to a particular kinsman.[8]

There is a combination of kinship terms and names. A Chinaman will probably not call his elder sister simply *Chah*. That is too indefinite. Usually, in addressing her, he combines her milk name with the name *Chah*. For example: *Yu Ko Chah, Yu Ko* being her milk name. Likewise, he may combine his elder brother's name, *Tsu Mo*, with the kinship term *Ko*, and call him *Tsu Mo Ko*. So it is with all of the terms.

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[7] Some terms need explanation in order to avoid confusion. The pronunciation of the character for husband is similar to that for father, and to the second character for daughter-in-law, but the three characters are quite different. Again, the pronunciation of the character for son is similar to that for brother's son; the pronunciation of the character for grandson is similar to the second character for sister's son, but the characters are not the same.

[8] This is not the case in the United States. When the American speaks about his uncle, we are not enlightened as to which of the five classes of uncles he refers.

In America husband and wife call each other by their personal names. In a face-to-face talk the wife does not address her husband as "my husband." This is the custom in China, also. But the Chinese, in giving up the use of the terms for husband and wife, have not found any substitutes for them. So in conversation between husband and wife, each simply proceeds to talk without using any term of designation when addressing the other. If a woman is talking with some one else, she is greatly embarrassed in referring to her husband. Sometimes she refers to him as "So and So's father," "So and So" being, of course, her son's name. Usually she refers to him simply as "he." When you hear a woman talk about "him," you know that, following convention, she is referring to her husband. She is too modest to speak about "him" as "my husband." Only the Chinese understand the underlying psychology.

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BOOK REVIEWS

METHODS AND PRINCIPLES

The Relation of Nature to Man in Aboriginal America. CLARK WISSLER. Oxford University Press: New York, 1926. 248 pp.

The problem of the character and extent of the influence exerted on man by his environment, has for long attracted deserved attention. Opinions, however, have been rather strongly opposed. Some have believed that the power of environment to mould not only the cultural but also the physical development of man has been the dominant factor of human history. Others, on the contrary, have felt that the potency of environment was greatly overstressed, and that except for a few obvious restrictive effects, it exerted but little direct and a very variable indirect control. The advocates of the dominance of environment have usually approached the problem and sought to establish their case, by analyzing various kinds of environment and then attempting to show a clear correlation between these factors and the cultural or physical characters of the inhabitants. Dr. Wissler in the present volume attacks the question from a different angle, that of the geographical distribution of anthropological traits.

The method followed is to select a series of traits, plot their distribution on the map, and then to show that these traits all cover continuous areas and tend to take the form of concentric zones surrounding a central nucleus, where the trait is most highly specialized or most frequent. It is then assumed that the peripheral zones, which are held by the simplest and most generalized form of the trait, represent its primitive form, and that the successive specializations as one approaches the central nucleus, are historically sequent developments of this primitive type, all of which have originated within the nuclear area and diffused outward in all directions. From the mere inspection of such a plotted distribution, then, one can determine the center of origin of the trait and the relative time sequence of its development and diffusion. Comparing the distribution of several traits, Dr. Wissler then finds that their centers are not only more or less congruent, but lie within a cultural area, and thus mark the region in which this particular cultural type reaches its highest expression. Seeking the cause for the concentric, zoning of traits, the author finds the culture area to be marked by

a definite type of environment, and that the characteristics of this ecological region are most completely developed at the cultural and somatic focus. The ecological, cultural and somatic centers thus coinciding, it is argued that a definite correlation is established. The environment is thus the determining factor in both culture and physical type, and these are most completely adapted to and dependent on their environment where it is most strikingly dominant. The final conclusion then is, that "human traits have geography because they are adjusted to external conditions"; in other words, environment is the source and conditioning force of both the cultural and physical characters of man.

The most extreme environmental position is thus taken by Dr. Wissler, since by declaring that both culture and physical type are the product of environment, he implicitly denies any significant genetic or historical relation between what are ordinarily spoken of as racial types. According to his view, any particular combination of physical traits which may be regarded as constituting a definite type, may arise independently anywhere. Dr. Wissler has presented his material and developed his theory in his usual clear and convincing fashion, and his book will appeal strongly to the layman. To anthropologists, however, it will, I fear, be something of a disappointment, for they will feel that, carried away by his enthusiasm, Dr. Wissler has dealt with his subject in an unfortunately one-sided manner, and will note that he has been regrettably careless at times as to facts, methods of presentation, and reasoning.

Before discussing the broader aspects and implications of the theory set forth, it is unfortunately necessary to refer to some points in regard to data and methods, which seem open to criticism. In the first place one finds the data used are sometimes antiquated, incomplete, or obscure. Thus fig. 5, showing the distribution of the chief mound clusters, is based solely on Thomas's map, issued thirty-five years ago, and quite ignores the large amount of work accomplished since. One wonders, in connection with fig. 6, what are the sources for the data on which the distribution of burial mounds is based. It can hardly be Thomas's maps, since in many of the states included within the area, these do not indicate a single burial mound, and it is an archaeological commonplace that such mounds exist far outside the limits shown, with a frequency as great as within them. One would also like to know the evidence for a "constant frequency" within any such extensive area. It is true that in

these cases, while greater accuracy might well be expected, the errors do not materially affect the result, but as much cannot be said in regard to the treatment of the outrigger canoe. For here, although Dr. Wissler purports to discuss the distribution of outrigger canoes and outrigger attachments, he deals only with a restricted portion of the immense area occupied by these traits. Were the whole area included the distributions would be seen to lead to quite different conclusions. Furthermore, Dr. Wissler has wholly omitted one of Haddon's important types of attachment and has given incorrectly the map supposed to be copied from Haddon's paper, having transposed areas 1 and 2 and failed to indicate outlying areas of type 1 in Melanesia.

Scattered through the book there are numerous aggravating, if careless, errors. For instance, there are many cases of contradiction between text, tables, and figures, e. g., figs. 17 and 19, fig. 26 and page 69, fig. 43 and pp. 158 and 159, etc. The first instance is a good example, for here although the first figure gives no data whatever for northern Asia or Europe (except France and Greece where the Mediterranean form of arrow-release is shown) the second gives the whole of this great area as Mediterranean—except Greece! It also shows all southern China and Tibet as Mediterranean, while fig. 17 indicates the Mongolian form. Again, there are occasional unqualified statements, such as that "all" living Indian tribes have straight, black hair (p. 156), or direct misstatements, such as that labrets are worn in the upper lip by the Alaskan and Northwest Coast tribes (p. 62). In some other cases, statements are made as facts, which are really only inferences based on rather meagre data.

More serious, however, is the false idea conveyed by some of the schematic diagrams, for these convey to the unprofessional reader a wrong impression, which the text further emphasizes. For example, fig. 32, p. 93 and the accompanying text suggest a type and regularity of distribution quite contradicted by the actual facts. For if the tribes concerned are plotted in their actual locations, one finds not a well-defined central nucleus surrounded by concentric zones, but a main "center," on the north and south of which there are two separate groups showing a lesser development of the trait, intervening between the "center" and a southerly peripheral group with the same intensity of development as the "center." The same is true even more strikingly of the statements in regard to the Grass Dance (p. 195) where the actual distribution is unzoned and quite unsystematic. The diagram

for the Sun Dance (fig. 31), although nearer to the facts, nevertheless gives an unfortunate impression of regularity. In each of these cases the true distributions are neither illustrated nor described, while misleading ones are used as evidence in the argument. I am quite aware that all these diagrams are explicitly said to be schematic, but there is a limit beyond which facts may not fairly be distorted.

Another form in which schematization or simplification gives an incorrect impression, is that exemplified in fig. 13, said to be based on the data presented by Hatt, with additions. In this case the map does not agree with the data, for Hatt gives type B as occurring among the Shoshoni, Ute and Dakota, type D among the Chinook etc. Further the map suggests and the text explicitly states (p. 23) that the various moccasin types are "mutually exclusive," whereas Hatt's data and those given by Wissler himself (*Anthrop. Papers* A.M.N.H. vol. V, p. 151) show that in numerous instances two or more types are in use by the same tribe.

It is an ungrateful task to call attention to these and other points which might be mentioned, but one must first examine the premises if one is to judge fairly the conclusions. What are the conclusions which Dr. Wissler has reached on data and by methods open here and there to valid criticism? The zoned distribution of traits which have diffused outward from a single point of origin has long been a commonplace; to this well recognized fact the author has given a rather unjustifiable appearance of regularity and symmetry. The conclusion that the center of diffusion is represented by the most specialized or developed form of the trait, and that it is mainly in this area that the successive specializations originated is also not new, but Dr. Wissler has again regularized the facts excessively, since in many cases (as for example in his own instance of the Sun Dance) it is clear that there are secondary centers which have contributed largely to the result. That this cultural nucleus is always centrally located within the area of the trait, is a conclusion really unjustified either by the mass of distributions known, or by the author's own data. Apart from other instances mentioned, one may refer to figs. 13 and 14 where the area occupied by moccasin type E (the most specialized form) is obviously peripheral. That the center of specialization often tends under favorable conditions to be roughly centralized geographically is true, but there are many factors such as topography, trade-routes, migrations etc. which may relegate

it to a marginal place. Even in so obviously favorable a region as the Plains, few if any distributions are really symmetrical.

That the peripheral, unspecialized forms of a trait are historically older and represent the undeveloped substratum, whereas the more specialized forms are historically the more recent, is a conception which has been employed for some time. Dr. Wissler, however, seems to me to give the idea too great an extension, by suggesting that valid conclusions as to trait specialization and implicitly therefor as to age, may be drawn from mere geographical position. According to this, the nearer a tribe is to the trait nucleus, the greater its specialization and the more recent must be its cultural acquisition. Where the actual distribution approaches the ideal single-center-concentric-zone type, this is undoubtedly true as a rule, but often and even in some of Dr. Wissler's own examples e. g. the Grass Dance, it is demonstrably and quite obviously not so. Again, when Dr. Wissler says (p. 189) that the "extent of diffusion is proportional to the time" he would seem to imply that the longer the time, the wider the limits of diffusion. But this is affected by so many other factors, that it can be maintained only as a very general tendency, and Dr. Wissler's own example of the historical spread of the Peyote, furnishes a good illustration of its failure in the concrete case, since the cult took as long to reach the almost contiguous tribes in Oklahoma as it did to get to Wyoming and Wisconsin.

The final conclusion reached is that since culture areas and ecological areas are often roughly coincident, and cultural nuclei often lie within the core of the ecological region, it follows that the cultures are conditioned by the ecological areas, since they are adjusted to them. This is merely another way of saying that culture is the result of and is determined by environment. Here again Dr. Wissler's fondness for universal statements, unqualified by any exceptions, gives an unwarranted impression. The whole form of presentation suggests that the totality of a culture is thus completely subservient to environment. Every anthropologist knows of numberless instances in which cultural traits are not only not adjusted to the environment or the result of it, but exist in spite of it. Every environment obviously exerts certain restrictive influences on its occupants, in that it supplies only certain kinds of raw materials. Through these it directly affects and limits the character of some aspects of material culture, and indirectly may influence a few, usually not very important factors in social and even religious life. Many

elements however of material culture and the majority of all social and religious factors are unrelated to environment, and owe their existence and much of their distribution either to historical, religious or economic causes, or to popular movements, trade-routes etc. To give to environment the omnipotence suggested by the author is to attempt the impossible. To quote from a discussion of the adequacy of environment to determine culture given by Dr. Kroeber in his "Anthropology" (p. 192):

> "By using environment or heredity, one can often seem to explain certain selected features of a culture, but the appearance is illusory, because one need only be impartial to realize that one can never explain in this way the whole of any culture . . . . the environmental and the biological-hereditary interpretation fail in proportion as they are pushed farther; in fact can be kept going only by ignoring larger and larger masses of fact to which they do not apply."

I have made but passing reference to the portion of Dr. Wissler's book in which he applies to man's physical traits the same methods and reasoning used for cultural factors, and in which he reaches parallel conclusions. The detailed criticism of this section I may well leave to abler and more competent hands than mine, but a few words must be said. In the main, the same general criticisms apply here as in the treatment of cultural facts. The author states well-known distributions sometimes only partially, sometimes inaccurately, and draws conclusions from comparisons between groups not always really comparable. His theory of the independent local origin and pyramiding of specialized characters fails, (as do all others which seek to explain local types as merely the result of local variation) in accounting for their peculiar and significant distribution—a distribution comparable with that of local types in the Old World, where they are mainly the result of known and demonstrable racial movements. Dr. Wissler's constant disregard of verifiable migration leads him to make such astounding statements as (p. 165):

> "so far as we know the Indians in North America for thousands of years before 1492 suffered no radical displacements."

As every one with even a rudimentary knowledge of the subject knows, this is absolutely untrue, and Dr. Wissler can hardly escape the blame for what has every appearance of deliberate misstatement in order to prove his case. Dr. Wissler says that there is need of

> "a safe technique for interpreting somatic distributions, towards which the assemblage of these few examples may be considered the first step."

The need is obvious, but the technique displayed is neither safe nor sane; it is often too inaccurate to be the one, and always too oblivious of other factors than that of plotted distributions to be the other.

I have been unsparing, perhaps even pedantic, in criticism of Dr. Wissler's book for two reasons. In the first place it is written obviously in the main for laymen,—for those who have neither the time nor the inclination to check the accuracy of the writer's facts, and who may readily be led astray by too generalized statements or too schematic a presentation of data. Under such circumstances it is a duty incumbent on the author to take exceptional pains to avoid errors; and when such care has not been exercised, it is equally the duty of the reviewer, albeit a most unpleasant one, to point them out. In the second place I do not like to see "a good horse ridden to death." The study of the geographical distribution of anthropological traits is one of the most valuable means of unraveling the intricate and often very obscure history of human origins and cultures. But it is not the only means, and taken by itself it may often lead one far astray. To quote again from Dr. Kroeber (op. cit. p. 335)

"valuable as the distribution principle is . . . . it can never be used mechanically. It must be applied with common sense and with open-mindedness toward all other techniques of attack."

It is just in this last factor that I feel Dr. Wissler has been lacking; he has let himself be carried away by his enthusiasm so completely, that he has spoiled a good case by overstatement.

When all's said and done, however, Dr. Wissler's book is a timely and forceful setting forth of a valuable method of approach to many of the problems of anthropology; its faults are mainly those of enthusiasm. It raises very sharply again the age-old controversy on the influence of environment, and carries the fight squarely into the territory of the physical anthropologists. It will undoubtedly arouse keen discussion; it should stimulate further careful and detailed investigation; and its very over-emphasis may be of lasting value in compelling attention to a technique which has already led to very significant results.

R. B. DIXON

Reallexikon der Vorgeschichte. Herausgegeben von MAX EBERT. Berlin: Walter Gruyter & Co. Vols. III–VII.

A notice of the earlier volumes of this encyclopaedic work, which continues to appear in installments of approximately eight signatures

each has already appeared in the AMERICAN ANTHROPOLOGIST (1925, 561 f.). The expectations raised have been amply fulfilled. It would be difficult to find a more comprehensive and up-to-date work of reference on the various aspects of culture-history. A summary review of the most important categories of articles will give the readers of this Journal some conception of its scope.

The treatment of physical anthropology has devolved on Professor Otto Reche (Vienna). Attention may be called to his series of articles on the various races of *Homo* (5: 361–380), which in part introduce a novel terminology. Thus, Cro-Magnon man is introduced as *H. priscus*, and the Armenoid race as *H. tauricus*. The latter is considered a close relative of *H. dinaricus*. Reche is of opinion that the Dinaric and Tauric types do not represent primary stocks, but have resulted from a mixture of broad-skulled and narrow-faced races, brachycephaly and leptoprosopy being assumed dominant. The assurance with which the mental traits of living races are registered reveals little understanding of the difficulties involved in an objective psychological study of race differences.

Palaeolithic prehistory, as might be expected, receives competent and adequate treatment at the hands of Professor Hugo Obermaier (Madrid). His theoretical views were clearly and concisely set forth in the earlier volumes under such captions as "Capsien," "Acheuleen," etc. Among his more recent contributions, that on "Kunst" (7: 136–161) may be singled out for special notice. The author insists that true composition is lacking in Pleistocene animal representations (140). He accepts Breuil's proof of a tendency for geometrical designs to evolve from the progressive conventionalization of realistic forms, but cautiously adds: "*Dieser Werdegang ist natürlich keineswegs ausschliesslich zu fassen.*" In fact, he explicitly admits the origin of certain patterns in technical processes (141). As in previous writings, Professor Obermaier brings out the contrast between the static Franco-Cantabrian art, with its virtual neglect of the human species, and the dynamic East Spanish style, with its profusion of human forms (152).

The department of theoretical ethnology, primitive sociology, and primitive religion, is in Professor R. Thurnwald's (Berlin) charge. His summaries of concrete data, under such captions as "Familie," "Heirat," "Kaste," "Klan," "Jünglingsweihe," and innumerable others, are usually admirably concise summaries of knowledge. It is gratifying to note how largely he utilizes American

sources. Naturally there will be room for differences of opinion in matters of interpretation, but Thurnwald's position will generally be found to be sane and temperately expressed. In the interesting discussion of diffusionism ("Kulturkreis," 7: 118–122) it might have been well to point out that Von Luschan's well-known treatise on "Zusammenhänge und Konvergenz" (*Mitteil. der Anthrop. Gesellsch. in Wien*, 1918, 1–117) deliberately ignores the distinction between parallelism and convergence.

Eduard Hahn, in a series of articles, ("Hackbau," "Haustier," "Hund," etc.) expounds the views on economic history well-known from his previous publications This highly suggestive but opinionated writer takes little cognizance of criticisms of his theories and sometimes commits strange inaccuracies, as when he asserts:

"Karl v. d. Steinens Bakairi hatten keine Hunde, und ebenso hat er auf Neu-Seeland gefehlt, sonst scheint er über die ganze Erde verbreitet" (5:403 f.).

Dogs were certainly known to the Maori, who occasionally ate them (Raymond Firth, "Economic Psychology of the Maori," *Journ. R. Anthrop. Inst.*, 1925, 340–362). On the other hand, the Tasmanians and Andamanese seem actually to have been without dogs. In the article "Kamel" (6: 196) Hahn adheres to his old idea that the dromedary is nothing but a domesticated form. He ignores Otto Antonius's contrary interpretation (*Grundzüge einer Stammesgeschichte der Haustiere*, 1922, 309 f.); yet the reported infertility of camel-dromedary hybrids at least merits some discussion. On the other hand, the statement on "Hackbau," (5: 12 f.) an integral part of Hahn's system, is surprisingly conservative: the author no longer suggests that tillage with the hoe is an exclusively feminine occupation but merely lays down the acceptable proposition that women invented horticulture and are still the main cultivators in many parts of the globe.

Domesticated species are also discussed by Peter Thomsen and Hilzheimer.

Among the ethnographic essays, that by K. B. Wiklund on the Finno-Ugrians (3: 364–382) stands out for its thorough-going discussion of both linguistic and somatological data. Professor Wiklund places the primeval home of the stock about the upper reaches of the Volga and Oka, as well as their affluents. He admits certain morphological and lexical coincidences between Finno-Ugrian and Indo-Germanic that argue for an ultimate genetic unity but does not

regard the question as definitely settled,—indeed, serious research along these lines has only recently begun.

Naturally much space is devoted to Egyptological, Assyriological, and classical topics; and anthropologists who wish to acquire a rapid survey of these fields can hardly do better than to consult the relevant essays of the *Reallexikon*. As was set forth by Professor Ebert in his prefatory announcement of the work, it is designed primarily for students interested in Europe and adjoining areas. This does not by any means imply the exclusion of other regions—for example, Thurnwald considers them all—but does involve a special emphasis on what is better known, hence less requiring exposition. It is a pity that uniformly intensive treatment has not been given to the prehistory of all continents, so far as known; the *Reallexikon* might so easily have become an encyclopaedia of the whole of culture-history. Even with this qualification, however, it approaches that goal more nearly than any other work known to the reviewer and must be reckoned one of the most remarkable products of recent scholarly collaboration.

ROBERT H. LOWIE

The Scientific Study of Human Society. FRANKLIN H. GIDDINGS, Chapel Hill, University of North Carolina Press, 1924.

Realizing that advancement in the study of man has not kept pace with accomplishment in the 'natural' sciences, inquiry among sociologists has become introspective. For those who have some insight into the exacting prerequisites for scientific work in other fields, the situation in the humanities is not encouraging. History, among other studies, presents an embarrassing choice to the would-be scientific historian. It is either a bare chronological statement of events or a form of narrative art, in which the plot turns upon motives imputed to men and groups by writers to whom they are unknown. Economics, to many economists, appears to be merely a twentieth century restatement of eighteenth century speculation concerning human nature when it engages in buying and selling. To some sociologists, sociology has never been more than a gesture of homage to Comte and Darwin and a reprint of miscellaneous readings on biology, anthropology, economics, politics, psychology, ethics and philosophy.

Disturbed evidently by such observations, Professor Giddings completes thrity-two years of sociological effort with a volume on

methodology. *The Scientific Study of Human Society* is smaller than many books which have preceded it from the same pen. But its claim to the attention of students is compelling. In it the distinguished author proposes not only "to indicate wherein and to what extent sociology is indubitably a scientific study of Human Society," but adds his unqualified conviction that the book is at present "the only work of its kind." Such words written by the Dean of American sociologists cannot be ignored. They challenge students not only to examine the bases of Professor Giddings' security but to test their own methodological foundations.

There is little to be gained by dwelling on the sociological foreground of the book. This is composed of the familiar concepts formulated by Professor Giddings when he was a young instructor at Bryn Mawr and Columbia, and since elaborated repeatedly. Nor will students of methodology in the social sciences be served by considering the immediate practical purpose of the book. This is the instruction of social workers and social "engineers" in a way of "factorizing" or breaking-up human behavior into pieces suitable for measuring, counting, weighing, plotting and correlation. As such, it is merely another manual of statistics. It is important, however, to note that Professor Giddings maintains that human beings in their behavior conform in the long run to certain normal or natural action patterns, which upon sufficient repetition become folkways or institutions. Institutions also in their turn, when regarded as changing historical entities, develop according to patterns or through a normal or natural series of cultural states.

> We encounter first a succession of form-action patterns which constitute savagery; then a succession of form-action patterns which constitute barbarism; and at length a succession of form-action patterns which constitute what we are pleased to call civilization! (pp. 13–14).

The business of the sociologist who wishes to be a scientist is to find these patterns and to find them by means of quantitative procedures.

> The final verification of an alleged fact . . . . is only through much repeating of observations and measurements . . . . Physicists and chemists, astronomers and geologists, biologists and psychologists are tirelessly repeating their observations and their measurements of presumptive fact. Social psychologists and sociologists must get the habit. (p. 58).

In other words, in these and many other statements, Professor Giddings identifies the aim and method of the science of man with

the aim and technique of certain natural sciences, namely the determination of the natural or normal by means of mathematical analysis.

Can students of societies and institutions accept this identification? Can the humanist, the sociologist, the historian, the anthropologist, the archaeologist, the psychologist, the economist, the philologist reach common ground on this point? Can they agree that what they desire to find is the normal? Are they willing to consider as the raw material of scientific inquiry in their respective fields only that which can be weighed, counted, measured and plotted? Will they as scientists be willing to ignore all that resists statistical procedures? Professor Burtt, the historian of the methodological foundations of physics, the most mathematical of the natural sciences, has expressed himself clearly on the matter:

> When in the interest of clearing the field for exact mathematical analysis, men sweep out . . . . all non-mathematical characteristics . . . . they have performed a piece of cosmic surgery which deserves to be carefully examined.

Recent students of methodology in the social sciences have been equally clear in their dissent from Professor Giddings' assumptions.

It has been said that although the phenomena of interest to the curious mind are extraordinarily diverse, that form of human behavior known as scientific inquiry is unified by the fact that inquirers in all fields are engaged on one problem, the unraveling of the puzzle of the present. In slightly other words, each inquirer, whether in botany or psychology, chemistry or anthropology, starts with the phenomena he finds in the world about him, and asks of it one question, "How does it come to be as it is?

In answering this question, however, the diversity of the material suggests, when it does not compel, a diversity in ways of handling it. The chemist and the worker in similar fields is in a sense fortunate. The character of his material permits him to withdraw to the isolation of his laboratory. There the original inquiry is somewhat recast. The fundamental problem still remains that of determining how the present comes to be as it is, but the chemist approaches it by asking a new question, "What are the chemical constituents of matter?" This he answers by the use of experimentation, mathematical analysis and other techniques, all conducted in abstraction from the environment. The conclusions he reaches are in no way influenced by events outside his laboratory window. The analyst does secure a series of results which enable him to say that normally, naturally,

or if nothing interferes, the constituents of water remain H_2O whether he conducts his experiments in a monarchy or a democracy, in the Arctic circle or in a Kaffir kraal.

But this type of inquiry is not all-inclusive. There are other phenomena in the present which cannot be abstracted for analysis from the external world. Their resistance to laboratory techniques, however, does not withdraw them from the probings of the curious mind. Neither does it prevent science from asking of them its fundamental question. The palaeontologist seeks to find out how the present distribution of fossil forms of life comes to be what it is, but he is compelled, before he finds an answer, to consider the appearance and recession of glaciation, the shifting of ocean shores and river beds, volcanic upheavals and like events. Similarly, when the anthropologist completes a description of a primitive group, and confronts the problem of explaining how the present culture of that group comes to be as it is, so different from co-existing cultures, he cannot ignore the influence of invading strangers, the extension of trade and a host of other historical events. These events would be alien and irrelevant to the laboratory technique of solving the problem of science, but are essential and indispensable to the understanding of present phenomena in the anthropologist's own field.

In other words, although scientists are unified by a common aim, they are forced by a different impingement of events in their respective fields to develop different techniques. The statistical technique is extremely useful where the impulsion of events is presumably absent or of relative unimportance. To the extent, however, that the present is a product of the past, concentration on the procedures of counting, measuring and weighing, to the practical exclusion of all other techniques, merely hinders thought.

Of course, it is easy to forgive Professor Giddings his faith. The mysticism of numbers has captured many minds and will continue to do so. Professor Giddings, moreover, is following distinguished masters. It was the legerdemain of no less a person than Auguste Comte which drew sociology from the same hat which had previously contained physics. It was Condorcet, Quetelet, Descartes and a long line of Western European philosophers who sought to discern behind the veil of events, the reality of the natural and computable. Considering the difficulty in which students of man now find themselves in accounting for present diversities in cultures, and considering the long and unproductive use in the social studies of the methodo-

logical assumptions of physics and related sciences, Professor Giddings is to be congratulated for raising the question of method even though he answers in the same old way.

MARGARET T. HODGEN

Archiv für Rassenbilder. Bildaufsätze zur Rassenkunde, herausgegeben von E. V. EICKSTEDT. München: J. T. Lehmann, 1926. (2 mk, for each series).

This set presents a very interesting method of disseminating a knowledge of racial types. The four envelopes before us contain each a series of ten card-board sheets with from one to three photographs accompanied by a descriptive text, the information being in part historico-geographical and ethnographic as well as somatological. In the first essay the editor, Egon von Eickstedt, treats the Tamil; the second, by Dr. J. Wastl, is devoted to the Bashkir; in the third Dr. Hella Pöch presents and characterizes a group of Ukrainian Volhynians; and in number 4 R. Heine-Geldern comments on M. H. Ferrars' pictures of Burmese types.

The illustrations are clear and the text concisely summarizes valuable information not otherwise readily accessible to the layman. From the prospectus we gather that altogether sixteen of these *Bildaufsätze* have been issued and that many others are to appear. Among the former, we call attention to K. Gorjanovic-Kramberger's "Der diluviale Mensch von Krapina" and H. Bryn's "Norweger." The series in preparation include Dr. B. Oetteking's treatment of the Northwest Coast Indians, R. Pöch's Bushman and Australian types, and F. Sarasin's New Caledonians.

The pedagogical value of this publication for class-room purposes is evidently of the highest, and it is worth noting that slides are sold by the publisher at 15 mk. for a set of ten.

ROBERT H. LOWIE

Ethnologischer Anzeiger, Jahresbibliographie und Bericht über die völkerkundliche Literatur; herausgegeben von Dr. M. HEYDRICH (Dresden) und Dr. G. BUSCHAN (Stettin). E. Schweizerbart'sche Verlagsbuchhandlung: Stuttgart, 1926. Jahrgang I. Heft 1, 64 pp. (4 mk.)

This new periodical, planned to appear as a quarterly from 1927 on, seems to be a revival of the *Zentralblatt für Anthropologie*. The

initial issue establishes the pattern to be followed in the future. There is, first of all, a Bibliography, which purports to be as complete as possible, including material of ethnographic interest that may be scattered over journals of a more technical character. The arrangement is by continents, each being considered only once a year, and the several distinctive culture areas are treated under separate headings. The second section contains Reviews of the more important publications; special emphasis will be placed on valuable treatises written in generally inaccessible languages. From time to time there are to appear comprehensive summaries of special regions; for example, the present installment contains a résumé of Siberian work by M. Azadowskij. Finally there are brief Communications (*Mitteilungen*) about new investigations, congresses, museums, university activities, and personalia generally.

This worthy enterprise certainly merits general support, and we hope that it will prosper and grow in proportion to the competence of its management as indicated by this first *Heft*, which in its opening section is entirely devoted to Americanist interests.

ROBERT H. LOWIE

PREHISTORY

Our Early Ancestors. An Introductory Study of the Mesolithic, Neolithic, and Copper Age Cultures in Europe and Adjacent Regions. M. C. BURKITT. 243 pp., 30 pls. Cambridge University Press, 1926.

The author gives two reasons for writing this book. In the first place very few textbooks covering this particular field have been published; secondly the need of such a work was felt by the author himself as lecturer to University students as well as by the students themselves. He admits that this long and painstaking job is still far from completion even as far as Europe is concerned, and that it will be many years before the work is in any sense finished. Our knowledge of the Old Stone Age, especially that portion of it known as the Palaeolithic, is now fairly well crystallized and forms a safe basis on which to build a superstructure which will form a link between prehistory and proto-history. The volume begins with that period which was once known as the hiatus,—a period bridging the gap between the Magdalenian epoch with its reindeer fauna and realistic cave art and the culture known as Neolithic. This supposed

hiatus has vanished before our advancing and cumulative knowledge and in its place we now have the Mesolithic period.

Measured by Palaeolithic standards, the Mesolithic Period covers a relatively short space of time. Regionally it is represented by cultures differing slightly in fact as well as in name. The Azilian of Piette with its painted pebbles and flat harpoons of staghorn; the Tardenoisian of De Mortillet with its microliths; the Asturian of Count de la Vega del Sella; and the Maglemosean of Sarauw all go to make up the Mesolithic complex. And in recent years there is a tendency to detach the first or lowest rung of the Neolithic ladder and add it to the Mesolithic; I refer to the Epoch of the Shell Heaps in Denmark and its equivalent, the Campignian, in France.

"Neolithic Civilization" comes in for the lion's share of space. The most notable additions to human experience during the Neolithic Period are: (1) the domestication of animals and plants; (2) the manufacture of pottery, and (3) the pecking, grinding and polishing of stone tools, instead of merely chipping as a shaping process. A chapter is devoted to Neolithic typology, made all the more valuable by a well-selected series of plates.

Chapter VII is given over to "A Brief Sketch of England in Mesolithic, Neolithic, and Earliest Metal Age Times;" while the last three chapters out of a total of ten treat of "The Mediterranean Area and the Copper Age," "Preliminary Notes on the Bronze Age Cultures" (not envisaged in the title of the book), and "Art."

The author is taken to task by no less an authority than Sir Arthur Keith for making no attempt to fix in years the duration of the cultural epochs covered by the volume. The serious student of prehistory will not be disturbed by the omission; the general reader, however, is glad to have such details even though they have to be in the nature of the case only approximations or enlightened guesses. A fairly long and carefully selected list of references is added at the end of each chapter, enabling the student to delve deeper into the mines of information now at his disposal. The present volume is not the first from Burkitt's pen and we hope it is not to be the last.

GEORGE GRANT MACCURDY

Préhistoire de la Norvège. HAAKON SHETELIG. Oslo: H. Aschehoug & Co., 1926, 280 pp. 10 pls.

Theoretically, man might have lived in Scandinavia during an interglacial stage. One can simply say that no record was left of his

passage. Up to the present time no trace of a palaeolithic population has been found. The oldest relics date from post-glacial times and belong to the stage of culture known as the Maglemosean; they belong approximately to that which is called the Mesolithic Period in western Europe.

The author stresses the fact that while the whole of Scandinavia may be looked upon as a unit, Norway never has had the abundance of flint which, in Denmark and Sweden, has been the basis of a richer cultural evolution. Norway had only flints that were left in gravels by the Glacial Period. Thus while the oldest element of lithic industry in Norway was flint, use was made of hard fine-grained eruptive rock during the second cultural stage,—the so-called Nöstvet Epoch.

The Epoch of Nöstvet in Norway corresponds in age to that of the shell-heaps in Denmark and the Campignian in France. Porphyry, quartzite, syenite, and diabase do not chip in a way to produce utilizable edges comparable with those of chipped flints. It is no doubt because of this difference that the pecking and polishing processes were employed on tools made of these eruptive rocks even as early as the Nöstvet Epoch and before the polishing process was applied to tools of flint.

Nöstvet dwelling sites are situated along water courses and are today at a certain height above sea level; this latter fact makes it possible to fix the geologic age of the Nöstvet culture, to affirm that it was contemporaneous with the epoch of the shell-heaps in Denmark.

The Nöstvet culture probably resulted from indigenous evolution although it may have had an origin in common with the shell-heap culture. Use was made first of raw material found in and on glacial deposits; but before the close of the Nöstvet epoch the quarrying of the raw material from the abundant supply of eruptive rock in situ was carried on to a considerable extent.

In the second chapter, Shetelig discusses what he calls the Arctic Stone Age. As an example he cites the cavern of Viste near Stavanger. The occupants of the cavern were hunters pure and simple, the only domestic animal being the dog. Among the implements found were polished axes of diabase cylindrical in section,—a type similar to the one from Sigervoll and belonging to the Nöstvet epoch. By the side of this polished ax of diabase were found: an ax of staghorn, harpoons, barbless fishhooks of the Maglemose type, and small arrowheads

of flint with transverse edges,—all reminiscent of the Mesolithic.

As another example, Ruskenesset, a camp near Bergen belonging to the very close of the stone age, was cited. This station is contemporaneous with the stone cists of Scandinavia, hence is much younger than the station of Viste. Under the rock shelter of Ruskenesset lived in spring and early summer hunters of the stag and seal. Moreover, hunting and fishing were not the only industries, for bones of domestic animals occur, also imprints of barley on clay vessels, daggers of flint, and small fragments of bronze.

Finally an important phenomenon of the Arctic Stone Age is the realistic art represented by paintings and engravings on rocks in Norway and Sweden. It is an art the origin of which may be traced to palaeolithic traditions. The author lists sixteen engravings and four paintings from Norway, three engravings from Sweden, and one painting from Finland. All the figures are of animals, especially Cervidae. And here, as in France at an earlier period, art was the handmaid of magic.

The influence of the epoch of megalithic monuments did not leave a marked impression on the stone-age culture of Norway. A few stone cists representing the closing phase of the epoch have been found near Oslo. However, during this epoch, there seems to have been a rather intimate commercial contact between Norway on the one hand and Denmark and southwestern Sweden on the other. The largest and best chipped flint implements found in Norway were importations from Scania, Jutland, and the Danish islands.

The author adopts the classification by Montelius of the northern Bronze Age into six phases and states that all six are represented in Norway. The first phase began about 1800 B. C. and the sixth ended some 700 B. C. It is a mistake to suppose that stone tools were no longer used during the Bronze Age; there is abundant proof that they were used, especially flint, down to the very end of the Bronze Age.

As to the first use of iron in the north, a few finds reveal the coexistence of small objects of iron with bronzes characteristic of the fourth and fifth phases of the Bronze Age. Finally, with the beginning of the sixth phase of the Bronze Age, that which really forms the passage to the Iron Age properly so-called, bronze is always represented by objects of apparel and ornament, rarely by arms and tools of any size.

The pre-Roman Iron Age in Scandinavia is characterized by the mediocrity of its civilization—also by the rarity of the objects found.

During the epochs of Hallstatt and La Tène, the north was poor in gold compared with the riches of the Celtic countries. Shetelig notes that the Bronze Age limit of expansion toward the north exceeded that of the Iron Age. This fact coincides with the theory of Sernander that immediately after the passage from the Bronze Age to the Iron Age, there was a rapid change from a mild climate to one much colder.

The author emphasizes the marked difference between the pre-Roman and Roman divisions of the Iron Age. For the first four centuries A. D., of the Iron Age in the north, he chooses the name "Roman Period." During this period commerce via the North Sea played an important rôle.

Considerable space is given to the fifth and sixth centuries A. D., the Merovingian Epoch and the Grand Invasions. Then follows a chapter on the epoch of the Vikings, noted for its fine examples of sculpture in wood. Some fifteen pages are given to ship burials and naval construction. These have a certain relation to, but are not identical with, the chariot burials further south in vogue during the epochs of Hallstatt and La Tène. The closing chapter deals with the decorative art of the Iron Age in Norway.

Ten pages of bibliography and ten plates complete a work that is to be commended highly. To the average reader a few more illustrations would have helped to elucidate the text; moreover, there is nothing in the captions of the ten illustrations that would give a clew as to the localities from which the originals came.

GEORGE GRANT MACCURDY

Bronzezeit am Jenissei. GERO VON MERHART. 189 pp. (Anton Schroll & Co., Wien, 1926).

The archaeological world was already under obligation to Dr. von Merhart for his prehistoric researches in Siberia[1] before the present volume appeared. It is a source of satisfaction to his colleagues to know that his study of the Bronze Age bears evidence of the same thoroughness which characterized his previous work.

Comparing eastern Russia with the Minussinsk region, the author believes that the Bronze Age cultures in the two regions bear about the same relation to each other that the Hungarian and Ural do: the cultures of eastern Russia and Minussinsk are derived in part from the same sources, show, in part evidences of direct contact, and in part were subject to entirely different influences. The Bronze Age

[1] The Palaeolithic Period in Siberia, Amer. Anthropologist, N. S., 25:21-55, 1923.

in eastern Russia may be divided into three epochs: I, ca. 2500–1500 B. C. Mixture of stone, copper, and bronze objects. Related to the Fatjanowo culture of central Russia. II, ca. 1500–1000 B. C. Southern influence (Hungary, Kief) strong. The finds from Sëima are typical. III, ca. 1000–400 B. C. Iron plentiful toward the end of this epoch. Ananino culture. Scythian influence noticeable.

The Minussinsk culture may also be divided into three epochs, although the oldest epoch in eastern Russia is not represented: I, prior to 1000 B. C. Non-local types, Sëima for example. Geometric ornament only. II, ca. 1000–500 B. C. Geometric ornament. Realistic animal figures ornamenting tools. III, after 500 B. C. Most of the Minussinsk bronzes belong to this epoch. Strong Scythian influence. Zoomorphic ornamentation with plant motives toward the close. Not unlike La Tène culture.

The Fatjanowo culture is essentially central Russian but shows marks of contact with the very earliest phase of the metal age in eastern Russia. Its age, comparable with Bernburg and string ornament types of pottery, with Troy II–V, is estimated to be about 2000 B. C.

The oldest "kurgans" in the Jenissei valley belong to the well developed Age of Bronze. Each kurgan contains from one (seldom) to several graves; often a single grave will be found to contain remains of several individuals. The grave contents are for the most part bronzes: knives, daggers, picks, axes, celts, arrowheads, mirrors, needles, beads, buckles, earrings, rings for the ankles, etc. In addition to the bronzes, one finds bone objects, glass beads, gold objects, and pottery. Silver is unknown.

The collective kurgans belong to the close, or near the close, of the Bronze Age and show a distinct influence from outside,—presumably from the south or southwest.

The lugless socketed bronze axes of the Jenissei Government belonging to the "Krasnojarsk type" have been known for some time. The essential character of this type is the geometric ornament in relief—a feature which distinguishes it from the bronze axes of the Minussinsk district. A whole chapter is devoted to the objects found accompanying the Krasnojarsk type of ax and another to the animal figurations of the Bronze-Iron culture complex. The twelve excellent plates and sixty-five figures in the text add much toward helping the reader to visualize the meaning which the author has to convey.

GEORGE GRANT MACCURDY

The Upper Palaeolithic Age in Britain. D. A. E. GARROD. Oxford University Press, 1926. 211 pp., 49 ills., 1 map. ($3.50).

Miss Garrod's compilation of the available data for the Upper Palaeolithic age in Britain will be welcomed by students of European prehistory. Although Upper Palaeolithic industries of the continent have received a large amount of attention, the finds in Britain, scattered as they are among many different collections and only mentioned in old and frequently inaccessible scientific journals, have never before been brought together in a single volume. Miss Garrod has collected all the available data on the Upper Palaeolithic in Britain and includes not only what has been published before but also much new material.

This work, however, is more than a mere catalogue of Upper Palaeolithic industries. Miss Garrod has succeeded in correlating the data and shows Britain as an outpost of continental culture where although the successions of the latter culture are present, they are by no means completely represented nor altogether typical in every instance. The Middle Aurignacian culture is the most abundantly represented and most typical, but the Upper Aurignacian shows some local developments. Solutrean influences in Britain were comparatively slight and are in the main limited to a few proto-Solutrean points. Throughout the Magdalenian period, Britain remained marginal to the Continent, Aurignacian culture still lingering with only traces of Magdalenian culture in the south. There are, however, local developments in flint working during this period so that the author terms this local industry "Creswellian," after Creswell Craggs, the most typical station.

It is unfortunate that very little of the archaeological work done in Britain in the past has been systematic. This has resulted in great confusion of industries and an almost total lack of stratification at any of the many Upper Palaeolithic stations. For this reason, Miss Garrod has resorted, for the most part, to a typological classification of artifacts. While this procedure is especially dangerous in assigning individual specimens to any particular horizon, it is nevertheless useful in comparing the whole industry of Britain with that of the Continent, and Miss Garrod has been cautious in her conclusions.

J. H. STEWARD

AMERICA

Pomo Folkways. EDWIN M. LOEB. (Univ. Calif. Publs. Amer. Arch. Ethn., Vol. 19, No. 2, pp. 149–405, pls. 1–3, 1926.)

The rather reminiscent title of this monograph on the Pomo Indians of north central California only in part suggests its contents. Indeed, it runs the gamut of life from construction of houses to ideals of physical beauty, and embodies the most complete ethnological report on the group yet published. Just why the author, who devotes only three short paragraphs to what he seems definitely to consider "Folkways," should give the entire work that title is not obvious.

Important facts in regard to the religious cults of the Pomo and their neighbors are revealed by the present study. Among the Pomo these fell into three categories, the "old" ghost ceremonies, the kuksu ceremonies, and the late ghost dance religion, which reached the Pomo in 1872 and largely supplanted the two earlier cults. This first dance series is believed to be the oldest, four of its elements appearing to the author as "original;" these are the use of the bull-roarer, the impersonation of ghosts, the "Death and Resurrection" initiation, and the mutilation by cutting. The "old" ghost ceremonies were common to both Coast and Inland Pomo. The kuksu ceremonies for healing and initiation were also common to both, but to these the Inland Pomo had added separate cult ceremonies not so motivated. Still further to the east among the Patwin and Northern Maidu these further elaborated kuksu ceremonies seem to have developed into those of the Hesi cult, and in this area the original form of the "old" ghost dance was not present. The clear recognition of the older ghost ceremonies is a long step forward in tracing out the development of these quite elaborate northern California ceremonial complexes.

The Pomo social organization as depicted by Dr. Loeb is equally interesting, for a nascent sib organization and even traces of what might have become a moiety division seem to be present. Surrounded by patrilineal peoples, the Pomo were in nearly all questions of descent matrilinear. Certain names were owned by individual families, or as Mr. E. W. Gilford has termed them lineages. According to Dr. Loeb, such names were transmitted mainly in the female line, and as they implied a certain female lineage they almost amounted to matrilineal sibs. In the same manner certain offices and membership in the secret society were also inherited in the maternal line.

In a recent statistical study of Clear Lake Pomo village censuses, Mr. E. W. Gifford came to a less positive conclusion in regard to the prevalence of matrilineal descent. According to his analysis descent of chieftainship was matrilineal, but the majority of personal names were passed on in the male line. According to Dr. Loeb this conclusion is due to the fact that a census usually covers only two generations, while the inheritance of names and of secret society membership often skipped a generation. Moreover, it is claimed that many of the names in the census were nicknames and not the more esoteric personal names. The latter author backs his claims by an appeal to genealogies which do show a greater proportion of cases of matrilineal than patrilineal descent, but the cases are too few to be entirely convincing. Considering the intrinsic interest of these potential mother-sibs or female lineages appearing in a patrilineal area, it is unfortunate that the genealogies which Dr. Loeb presents are not more complete and enlightening. As the author points out, the Pomo situation forcibly illustrates the fact that once a tendency toward unilateral reckoning is established it may express itself in the formation of either maternal or paternal sibs. But the factors that lead to this variation of regional pattern among the Pomo do not seem as yet to be clearly understood.

Another interesting point which the present work brings out is the tendency among the Pomo to transmit various professions in certain families. This recalls the functional families of the Patwin described by Mr. W. C. McKern, and while the formulation of the latter appears too schematic, there is in these new Pomo data a certain amount of similarity. Dr. Loeb's study of Pomo ceremonies reveals several similarities to the southwest, especially the sacrifice of meal, ceremonial pole-climbing, and the rattlesnake ceremony. However, the author's claim that the inclination of the Pomo toward matrilineal reckoning marks them as marginal to the former area does not seem probable to the reviewer. The natives of southern California in their moiety organization, gentile fetishes, ceremonial importance of the dance-house, retreat of the gentile leaders or priests before ceremonies, use of the ground-painting, ceremonial pole-climbing, ceremonial offerings of meal, plumed prayer sticks, water from sacred springs, and tobacco, and by many other parallels in social and material culture, do seem marginal to the Southwest. These groups however, are all patrilineal in descent, as are also many typical "Southwestern" peoples. It therefore seems more in accord with the

facts to presume that the southwestern traits exhibited by the Pomo reached them through the medium of the southern and central California groups, and that their matrilineal tendencies might best be explained by their own internal organization.

In addition to the presentation and analysis of the religious and social organization, *Pomo Folkways* presents a mass of detailed information on the domestic and utilitarian pursuits of the people. Throughout, distinctions between the Eastern, Northern and Central Coast Pomo divisions are indicated and should be of great value for detailed comparative work in the area. A few more tables similar to the one indicating the distribution of ceremonies would possibly have made these differences more obvious. Such criticisms are of very minor importance however, for the work as a whole is one of the most thorough ethnologic studies of a Californian tribe extant. The author has organized a very large amount of valuable material and in the field of religion especially, his conclusions clarify a hitherto tangled situation.

WM. DUNCAN STRONG

University of Washington Publications in Anthropology, Volume 1, numbers 2–4, August, 1925. University of Washington Press, Seattle.

Three papers published simultaneously, two by Leslie Spier and one by Erna Gunther, inaugurate a new series in anthropology, in spite of their bearing the numbers 2, 3, and 4. Number 1, published in 1920 as the first paper of a series in Political and Social Science, now discontinued, has been taken over as the initial paper of the first volume in Anthropology.

The two papers by Leslie Spier are "The Distribution of Kinship Systems in North America," which comprises pages 69–88 and maps 1–9, and "An Analysis of Plains Indian Parfleche Decoration," pages 89–112. The first comprises a careful study of the distribution of types of kinship systems. Eight types are distinguished. These are named for typical peoples: Omaha, Crow, Salish, Acoma, Yuman, Mackenzie Basin, Iroquois, and Eskimo. The author refrains from discussing historical connections. Such a discussion would have been particularly welcome from one who has so thoroughly digested his material. However, he has accomplished the onerous task of studying and classifying the large body of scattered kinship data. Students should be indeed grateful for this important work.

"An Analysis of Plains Indian Parfleche Decoration" embodies the results of the examination of 244 parfleches in various North American museums. Design elements are isolated and their distribution discussed. Historical relations are concisely expressed in numerical tabular form.

Erna Gunther's paper is "Klallam Folk Tales." It constitutes number 4 and comprises pages 113–170. The tales are in English and are presented in abstract at the end of the paper. "Comparative notes are attached to the abstracts . . . . . These notes show a rather interesting affiliation with the tales of tribes to the north, particularly to those of Vancouver Island."

The new anthropological series, of which the above papers constitute the opening numbers, is octavo in size and printed in ten-point type. The typography is clean and pleasing and is exceptionally free from errors.

E. W. GIFFORD

The Classification and Distribution of the Pit River Indian Tribes of California. C. HART MERRIAM. (Smithsonian Miscellaneous Collections, vol. 78, no. 3. Washington, 1926. Pp. 1–52, 27 pl.)

This, the first of Dr. Merriam's long awaited contributions to Californian ethnology, many aspects of which he has studied more intensively than any else, discusses the ethnic relations and geography of a group of related peoples inhabiting a natural unit area in the northeastern corner of California. They constitute nine divisions of the Achomawi and two of the Atsugewi, in current terminology; in Dr. Merriam's, as many tribes of the Achoomah′-an and Atsookā′-an families of the Achomawan stock. This is the first time that either any complete or any reliable information has been made available as to the divisions of this stock. Under each tribe are given: the limits of its territory; a description of the area; its principal villages; adjacent tribes; names given, first, to related tribes and bands, second, to unrelated; names of the tribe in alien dialects; place names, with comments. This main body of data is prefaced by discussions of the general distribution of the stock, its internal classification, its environment (with a useful faunal list), a comparative vocabulary of the two principal speech forms, and a list of esoteric words; and there follow an alphabetic synonymy and notes on Shoshonean borrowing and "Coyote language." The plates show characteristic scenery and physical types. An excellent colored map is folded in.

This monograph is of the kind whose usefulness is permanent. The future is likely to value it even more than the present. It gives the basis for a culture, without which that culture must remain an unsubstantial thing to outsiders interested in it. There has been too little of this sort of work, especially on the Pacific coast, where native life is intensely localized and almost clutchingly rooted in the soil. That Dr. Merriam's inquiries are painstaking and his data as accurate as such data can be today, goes without saying; their fullness alone would carry conviction of his conscientiousness. Dr. Merriam continues to use English orthography for native names, and openly holds a brief in its favor. Most ethnologists and geographers are on the opposite side; but it is not a matter on which to lose feeling, as long as linguistic investigation is not involved. Either spelling is readily convertible into the other, for purposes of identification, which is what essentially counts. With Dr. Merriam's desire to avoid technical orthographies in matters of geographical and historical interest, the reviewer is wholly in sympathy; though he does not hold English spelling to be the only untechnical one available.

It is to be hoped that this paper will soon be followed by the promised cultural data on the Pit River Indians, and by the ethnogeographic and cultural information which Dr. Merriam has so long gathered on nearly all the other Indian groups of California.

A. L. KROEBER

L'art et La Philosophie des Indiens de L'Amérique du Nord. HARTLEY BURR ALEXANDER. Série de conférences faites à la Sorbonne. 114 pp.; 26 pls., of which 5 are coloured. Paris: Ernest Leroux, 1926.

This is a title well calculated to make some people raise their eyebrows, especially the second part of the title, for everyone concedes a strong sense of art and design to the Indian, but * * * * a *philosophy*? To be sure, those who have lived with Indians more or less intimately have always been aware that they, as well as other peoples, have a *weltanschauung*. Those of us who have lived more or less intimately with the Indians have first of all been struck by that in their life which is exotic; then in some insidious manner we have become aware of a certain and sure charm, a charm which does not at all belong with our philosophy, a charm it is difficult for us to set forth in concrete terms, let us say, a vague and yet penetrating acquiescence in life, a quiet and a dignity, in spite of all the adventitious material squalor of the

Indian camp, an all-around thoroughness of view-point towards the world and towards life, without hesitancy, without neurosis . . . . , and we have come back. We have come back again and again, some of us, most of us, either to study their culture according to our own scientific methods, or to soak ourselves in the outward forms of their art, we the artists and ethnologists. And some people, some trappers and pioneers got finally buried under, forgot they were white and became Indians: they were, in a way, the better ethnologists and artists.

But we artists and ethnologists, certain beyond the shadow of a doubt, as is the way of all peoples on earth, that our philosophy and our epistemology are the real and true ones, set forth the results of our investigations in learned print. And other people, who never saw an Indian in the flesh, but who came to certain conclusions about the psychology of primitives and its genesis, i.e., its progress towards the point somewhere in infinity where we the Indo-Germans stand at the present moment, these learned psychologists and sociologists proceeded to elaborate their theories. These have been called by many names. One of the best was "*participation mystique.*" It explained a great deal and will remain as one of the milestones. But no one had ever had the courage to consider the *weltanschauung* of the American Indian primitives *per se* as a complete and rounded thing, and not merely as a step on the way to our achievement.

For having done that, the work under review merits a place quite apart in all anthropological literature, even more in psychological and philosophical literature. That is the central idea, or rather the central inspiration of Professor Alexander's work, if I have read it rightly. His central thesis, which he develops through a consideration of several aspects of Indian life, and which will evoke criticism only from those few who have at their command a detailed knowledge of the manifold cultures from the Atlantic to the Pacific, the central thesis is one which will be noted especially by psychologists (or should I say estheticians?), namely: that the keynote of Indian psychology is "esthetic thinking."

Esthetic thinking vs. intellectual thinking, here is enough to stop some people, and make them wonder. It opens wide the door to all the philosophical controversies about concepts and ideas, or, as the French call them, *representations*. For, to think esthetically means to think with one's senses. But, the product of one's senses is what? a sensation? or a representation? And if one represents it, then one

has what? What sort of an image? a collective image? an individual image? Ask the Indian!

In other terms, we are faced by something different from our own system of psychology (or would we rather say our system of esthetics, or of epistemology?) Then, we are forced to admit it, we are faced by another system of knowledge, a system where one knows by sensing, not by thinking, not by cataloguing. Perhaps in expressing myself so strongly I go too far, I mean further than Prof. Alexander. But this theory of an "esthetic thinking" is a pregnant idea. It entails necessarily, and the author makes plentiful allusions to it, a comparison, even an opposition between our conception of a deterministically fixed world, and the Indian's conception of a universe of living things, including the rocks and the rivers and the trees, that melt and merge, and become amalgamated into one, and break apart again into discrete units, while the individual person is sucked into the vortex, feeling for all and feeling for himself at the same time. This is decidedly not our conception of the world.

There is a preface by van Gennep. One wonders why the editors allowed it to remain. It is a masterpiece of patronizing superciliousness.

Although this has nothing to do with the anthropological merits of the book, one is obliged to comment on the French style. It is in the very best tradition. One is reminded of Renan and his force of poetical imagery, couched in soberest prose. I cannot forego the pleasure of quoting a few paragraphs:

> Enfin, en tout ceci on trouve l'explication du mélange inextricable du réel et du mystique qui existe au fond de l'esprit de ces naturels. La vie actuelle et la vie du rêve, le fait et le symbole, tous sont dans leur pensée d'une même pièce; leur monde ne se constitue pas, comme est constitué le nôtre, d'un dédoublement en matière et en esprit, mais les deux éléments forment pour eux un seul être; et par conséquent toutes sortes de choses ont une réalité auxquelles on ne trouve nulle part aucune analogie. . . . .
>
> La pensée des naturels de l'Amérique dénote une qualité esthétique de l'intelligence qui est à sa façon comparable à notre pensée logique. Cette qualité n'est pas celle de l'analyse; et cette pensée n'est pas articulée, au moins non dans des modes verbaux; par conséquent, leur expression ne s'assujettit pas aux transpositions et aux permutations régulières qui sont les marques de nos raisonnements scientifiques. . . . .
>
> La thèse, ou programme d'étude, de la pensée et de l'art de l'Indien américain que j'ai essayé d'exposer, est que cette pensée et cet art sont les manifestations d'un esprit essentiellement esthétique et, par conséquent, synthétique dans ses modes d'expression. Pour le Peau-Rouge, il y a une

alliance intime du réel et de l'idéal, telle que l'image ne se distingue pas de la réalité et que le rêve se mêle à la vie actuelle. La nature et l'humanité constituent pour lui une chose unie; il n'y discerne pas une dualité, et l'objet en lequel elles se forment devrait se représenter plus comme image et drame que comme mécanisme. Le monde entier a pour lui quelque chose d'un fantôme, bien qu'il nous fasse noter qu'il ne reconnaît aucune autre réalité que celle de ce fantôme. . . . .

But a reviewer may not quote forever. Let me only call attention to the first five pages of Chapter VI, and the last six pages of the same chapter.

JAIME DE ANGULO

The Technique of South American Ceramics. S. LINNÉ. Göteborg 1925. 199 pp., 44 figs., 9 maps.

This work was stimulated by Erland Nordenskiöld, follows the methods of his *Comparative Ethnographical Studies*, and attains to results worthy of that illustrious precedent. It is therefore hardly necessary to specify that the author's investigations are critical and exhaustively thorough, that the literature has been gone over with completeness, and that conclusions are never either forced or avoided. The topics considered are: distribution of pottery making in South America; pottery-replacing vessels; sex labor; composition and working up of clays; tempering (including microscopic sections and 8 pages on the use of fresh-water sponges); porosity; the building up processes; smoothing and handle addition; firing; painting, coating, and varnishing; mending; manufacturing centers and trade spheres; synopsis and conclusions. The maps show distributions as follows: 1, non-pottery-making tribes; 2, basket-moulded pottery and waterproofed baskets; 3a, b, tempering materials; 4, primitive sphericalness; 5, firing methods; 6, slip; 7, varnishing; 8, variations of an Inca type; 9, centers and trade relations; all of these but no. 8 are continental maps. This is a valuable work. We need something similar for North America.

A. L. KROEBER

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ANTHROPOLOGICAL NOTES

Second Annual Meeting of Catholic Anthropological Conference

(Held at the Catholic University of America, Washington, D. C., April 19, 1927)

The following delegates and members were present: Rev. Dr. C. J. Connolly; Dr. J. DeS. Coutinho; Dr. Anna Dengel, Cath. Med. Missionaries; Bro. Dominic Augustine, F.S.C.; Bro. Francis, F.S.C.; Rt. Rev. Msgr. Wm. Hughes, Bureau Cath. Indian Missions; Very Rev. E. J. McCarthy, Chinese Miss. Soc. of St. Columban; Rev. R. J. McWilliams, S.J.; Very Rev. Dr. M. A. Mathis, C.S.C.; Mr. R. B. Riordan; Mr. W. F. Sands; Rev. Edgar Schmiedeler, O.S.B.; Rev. F. B. Steck, O.F.M.; Very Rev. Dr. J. B. Tennelly, S.S., Negro and Indian Miss. Board; Rev. Dr. F. A. Thill, Cath. Stud. Miss. Crusade; Rev. J. C. Thomann, A.F.M.; Very Rev. J. J. Thoral, S.M.; Rev. Sidney Turner, C.P.; Rev. Claude Vogel, O.M. Cap.; Rev. Dom Augustine Walsh, O.S.B.; Very Rev. Dr. N. A. Weber, S.M.; Rev. J. M. Cooper.

After a short opening address of welcome by the President, Rt. Rev. Thomas J. Shahan, D.D., an informal report of the progress and prospects of the Conference was given by the Secretary.

As a result of an extensive discussion, participated in by nearly all the delegates and members present, it was decided to start the publication of a small four-page or eight-page quarterly bulletin. For the present at least, the purpose of the bulletin will not be to serve as a medium of publication for original scientific material coming in from missionaries. Its purpose as outlined will be to promote interest in and advancement of anthropological studies in general and of the work of the Conference in particular among (a) Catholic missionaries, (b) Catholic mission candidates, seminarians, and college students, and (c) the Catholic public at large.

The bulletin will publish short articles or contributions on such subjects as: value and importance of anthropological studies to missionaries, and others; news notes; outlines of our present knowledge of outstanding questions and problems in the field of anthropology, with short bibliographical references; questionnaires to serve for missionaries in the field and for such groups as the Crusade study

clubs; suggestions for missionaries as to material needed and as to methods of gathering same.

The bulletin will be non-technical, but will, it is planned, be kept at a high level of popularization. It will not take the place of the yearbook, but will be quite independent of and additional thereto, and will serve quite another purpose.

The question was raised as to the advisability of making next year's meeting one of wider appeal through the inclusion of a short program of papers or talks on anthropological topics of more general interest. No vote was taken on the question, its decision being left to the Executive Board.

It was unanimously agreed to continue for the coming year the same officers who had served for the past year.

JOHN M. COOPER, *Secretary*

A LETTER FROM DR. RÓHEIM

Budapest, 14.—2.—1927.

To the Editor of the AMERICAN ANTHROPOLOGIST

Sir,

An American edition of my book on *Australian Totemism* (George Allen and Unwin, London) is announced. It may interest the American reader to know that the curious process of calling a book on *Australian Totemism* "Social Anthropology" merely represents the publisher's (Liveright in New York) views on the matter and not the author's. I was never asked about it and would certainly not have consented to this ridiculous and misleading change of title if I had been.

Yours faithfully,
G. RÓHEIM.

PREHISTORIC MAN IN EAST AFRICA

A complete human skeleton has recently been found at Nakuru, Uganda, East Africa, by L. S. Leakey, a member of the Cutler Expedition. Near the skeleton, which was uncovered at a depth of twelve feet, were over a hundred stone implements described as "Mesolithic" in type. The skull has a nose of medium width and lacks the prognathism characteristic of the negroes. Apparently the find is of considerable antiquity.

Other finds in the Uganda have brought to light implements which are comparable to those of the early stages of the European Palaeo-

lithic. Other implements which have been found in Uganda by Mr. Wayland, the government geologist, are small geometric forms very similar to the Azilian microliths.

THE INDIAN POPULATION of the United States has been increasing during the past ten years according to Albert B. Reagan, expert on Indian affairs. During this period the number of aborigines has grown to 349,595, an increase of 16,585 or approximately 4.8 per cent. The tribes which have most notably increased are the Navajo, the Cherokee and several groups in Oklahoma. This increase he attributes to government medical attention and improvement of living conditions.

DR. SVEN HEDIN, the Swedish explorer, is preparing to set out from Peking on a long expedition to the interior deserts of China. The American and English anthropologists at the Peking Union Medical College arranged to coöperate with the expedition in studying the evidences of stone age life from the desert region. Young Swedish students of archaeology and geology will accompany Dr. Hedin.

EXPLORATIONS AT THE ETOWAH MOUNDS in northern Georgia, have been carried on during two seasons by the Department of Archaeology, Phillips Academy, Andover, Mass., under the direction of Warren K. Moorehead. About one hundred stone graves were discovered which contained engraved shells, various ornaments, pottery vessels and some engraved copper plates. Some of the human figures obtained are comparable to those of the Toltec and Maya.

Several complete graves have been shipped to various museums where they have been set up in natural position. Any museum director desiring one of these graves is requested to communicate with Mr. Moorehead at Cartersville, Georgia.

THE SUL ROSS STATE TEACHERS COLLEGE OF TEXAS has carried on considerable anthropological research in recent years. Investigations in the Big Bend region conducted by Roy Bedichek, R. A. Studhalter and V. J. Smith resulted in the amassing of a large number of specimens which served as a nucleus for the anthropological division of the museum. Particular attention has been devoted to the dry rock shelters of the Trans-Pecos region which is of interest because of its position intermediate between the area of cliff dwellings to the west and the plains to the east. A large number of pictographs and petroglyphs have been recorded.

MR. H. D. SKINNER delivered a lecture on "Maori Decorative Art and its Relationships" before the joint meeting of the American Ethnological Society and the Section of Anthropology and Psychology of the New York Academy of Sciences at the American Museum of Natural History on January 31, 1927.

MR. WILLIAM LLOYD WARNER, formerly a graduate student in the Department of Anthropology of the University of California, is making a survey of the North Australian aboriginies for the new Department organized at the University of Sidney by Professor A. Radcliffe-Brown. Mr. Warner had measured three-hundred natives in Darwin and was preparing to go to Crocodile Island in the beginning of April.

DR. WILLIAM DUNCAN STRONG, Assistant Curator of North American Ethnology of Field Museum of Natural History, Chicago, Illinois, sailed on June 25 from New York with the MacMillan expedition to Labrador. Dr. Strong will spend part of the summer of 1927 excavating the supposed Norse ruins at Nain. The remainder of his stay in Labrador will be devoted to a study of the Naskapi Indians along the lines of both ethnography and physical anthropology. The expedition plans to remain in Labrador until September, 1928.

THE CENTRAL SECTION OF THE AMERICAN ANTHROPOLOGICAL ASSOCIATION held a meeting in Chicago, Ill., March 25 and 26, 1927. A large number of interesting papers were presented before the section by its members.

Antiquity, a quarterly review of archaeology, has been founded in England under the editorship of Mr. O. G. S. Crawford, F. S. A. While the journal is to deal primarily with English archaeology, the antiquities of other areas, especially America and Africa will be given prominence. Articles on early history are also to be included occasionally.

Each issue is to contain about 100 pages. The annual subscription is one pound. Those desiring to subscribe should communicate with O. G. S. Crawford, Nursling, Southampton. The first number was issued in March, 1927.

THE WISCONSIN STATE HISTORICAL MUSEUM plans explorations of Indian mounds in the vicinity of Fond du Lac County, Wisconsin under the direction of Charles E. Brown, director. It is believed that some of the mounds mark the sites of Winnebago Indian settlements.

RECENT FINDS in the Belgian Congo of tools, arrowheads and other weapons reported to be closely similar to artifacts of the European neolithic period, are now under the charge of the Belgian government and will be excavated by a competent archaeologist.

PROVISION for cooperation by the Smithsonian Institution with state, educational and scientific organizations in the United States for continuing ethnological researches among the American Indians, and the preservation of archaeological remains, would be made in a bill introduced in the House of Representatives by Mr. Byrns, of Tennessee. The bill would authorize an appropriation of $20,000, to be expended for this purpose. —*Science*

DR. GEORGE GRANT MACCURDY, of Yale University, completed on February 4 a lecture tour of four weeks. He spoke twice at the University of Illinois, twice for the Davenport Public Museum, and once each for the Surgical Club of Omaha, the University of Iowa, the University of Michigan, the Toledo Art Museum, the University of Buffalo and the Academy of Sciences of Warren, Pa. Dr. MacCurdy's lectures were on prehistoric archaeology and dealt largely with the latest discoveries as well as with the work of the American School of Prehistoric Research, of which he is director.

—*Science*

DR. R. R. MARETT gave the Frazer lecture in anthropology at the University of Cambridge.

KNUD RASMUSSEN, the Danish explorer, is preparing for a new Arctic expedition, the aim of which will be to throw light on the emigration of the first men into the Arctic region, investigating the origin of the Eskimos and their relation to other primitive people.

Science

PROFESSOR G. ELLIOT SMITH, professor of anatomy in the University of London, delivered the Huxley lecture at Birmingham University on February 1 on "Science and Culture."

DR. GEORGE GRANT MACCURDY of Yale University, Director of the American School of Prehistoric Research, has been designated to represent the Paris Society of Anthropology at the Commemoration of the Two Hundredth Anniversary of the Founding of the American Philosophical Society, to be held in Philadelphia, April 27–30, 1927.

GEORGE BYRON GORDON, director of The University Museum, University of Pennsylvania, for over sixteen years, died suddenly in January. Dr. Gordon was born on Prince Edward Island in 1870. He studied at the University of South Carolina and at Harvard University. After graduating from Harvard, he was chief of the Harvard expedition to Central America, for six years. In 1902 he was appointed assistant curator of anthropology at the University of Pennsylvania, curator in 1904, and assistant professor in 1907. Dr. Gordon was the author of a number of works on archaeology. At the time of his death he was in charge of two expeditions which are operating at Ur and at Beisan. —*The Museum News*

DR. WALDEMAR JOCHELSON gave a lecture on "The Prehistory and Present Ethnography of Siberia and Its Relation to Adjacent Countries" on May 9, 1927 before a meeting of The American Society for Cultural Relations with Russia in conjunction with The American Ethnological Society.

The American Scandinavian Review (March, 1927, 181) announces that Baron Erland Nordenskiöld has received the L. Angrand Foundation prize for his *Comparative Ethnographical Studies*.

DR. BRUNO OETTEKING of the Museum of the American Indian, Heye Foundation, spent last summer in Germany and Switzerland visiting various institutions in the interest of physical anthropology.

DR. A. I. HALLOWELL, University of Pennsylvania, made an investigation in January of the social structure and kinship of the St. Francis Abenaki.

THE LINGUISTIC SOCIETY OF AMERICA has been elected to membership in the American Council of Learned Societies. E. H. Sturtevant and Leonard Bloomfield have been appointed as representatives to the council. The first issue of *Language*, the journal of the Linguistic Society, appeared early in 1927.

PROFESSOR E. SAPIR is in California this summer for the purpose of investigating some of the aboriginal languages. Dr. Jaime de Angulo has begun the study of Karok and is planning to visit other tribes in northern California in the interest of linguistic research.

DR. LESLIE SPIER, who has been for several years connected with the University of Washington, Seattle, has accepted a professorship of anthropology in the University of Oklahoma, which is establishing an independent department in the fall.